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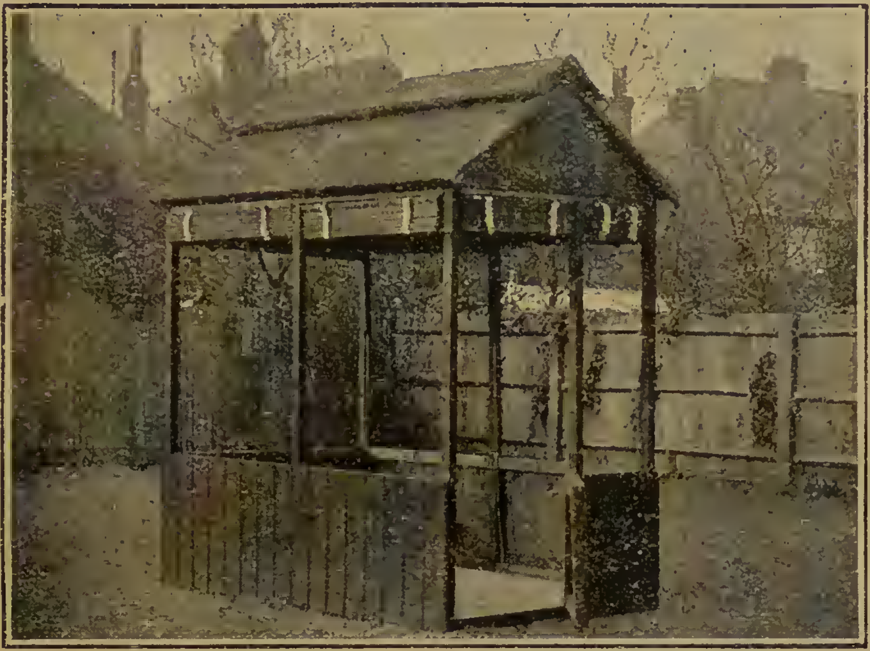

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PREFACE.

The Annual Conference for 1912 was held in Manchester at the kind invitation and with the co-operation of the City of Manchester and the County Borough of Salford.

A Joint Committee was appointed to arrange the subjects for discussion, and the programme selected was as follows:

Opening address—Professor E. W. Hope, M.D., M.O.H., City of Liverpool.

SECTION I.—**Tuberculosis in Childhood.**

PAPERS.

(*a*) The determination of its presence and extent in the system; its prevalence; statistics. Dr. R. W. Philip, Physician to the Royal Infirmary and the Royal Victoria Hospital for Consumption, Edinburgh.

(*b*) The share taken respectively by human and bovine tuberculosis in the infection of young children. Professor Sheridan Delépine, Professor of Public Health and Bacteriology, Victoria University.

Professor G. Sims Woodhead and Dr. Nathan Raw also contributed papers.

(*c*) The means of detection of tuberculosis during school life; its prevalence. Dr. John Priestley, Senior School Medical Inspector, Staffordshire County Council.

(*d*) The special factors making for its extension in the school; the measures of prevention. Dr. J. Edward Squire, C.B., Senior Physician, Mount Vernon Hospital for Consumption.

(*e*) Hospital schools. Mrs. W. Leslie Mackenzie, Member of the Edinburgh School Board; E. D. Telford, Esq., F.R.C.S., Honorary Assistant Surgeon, Royal Infirmary, Manchester, Surgeon, Manchester Hospital for Sick Children.

(*f*) Open-air schools for tuberculous and for delicate children—other provision which may be made. Mrs. M. D. Power Sweeney, M.A., Late Senior Assistant, Montpelier House (L.C.C.) Open-Air School, London; Head-mistress, Durham House School, Crouch Hill; Dr. C. E. Last, Medical Officer, Millfield Home for Children for Pulmonary Tuberculosis, Metropolitan Asylums Board.

(*g*) Surgical tuberculosis—its needs and the result of treatment. Dr. H. J. Gauvain, Medical Superintendent, Lord Mayor Treloar Cripples' Home and College, Alton, Hampshire.

SECTION II.—The Powers and Duties of Sanitary Authorities and the Working of the National Insurance Act in connection with Tuberculosis.

This Section took the form of a discussion which was thrown open to the delegates.

Two introductory addresses were given in this Section by Dr. W. Leslie Mackenzie, F.R.S.E., Medical Member, Local Government Board for Scotland, and by Councillor Arthur Neal, of Sheffield.

The After-care of Patients who have been Treated in a Sanatorium was included in this Section, and was the subject of an address by Dr. H. W. McConnel, Honorary Secretary of Kelling Sanatorium, Holt, Norfolk.

SECTION III.—The Position and Work of Voluntary Societies in connection with Tuberculosis under the National Insurance Act.

The Section was presided over by Her Excellency the Countess of Aberdeen, who gave the opening address.

Miss Broadbent, Invalid Children's Aid Association; Dr. H. E. Dixey, Chairman of the Sanatorium Committee, Knightwick, Worcestershire; and Mr. E. S. Kemp, Charity Organisation Society, London, contributed papers.

Invitations to appoint delegates were sent out to all public health authorities, hospitals, universities, philanthropic societies, and to anyone interested in the subject of Tuberculosis in Childhood.

A large number of delegates attended, over six hundred being actually appointed, and the meetings, which were held in the Milton Hall, Deansgate, on June 5th, 6th, and 7th, were a great success. Some of the papers were illustrated with lantern-slides, which made them most interesting and graphic.

The delegates were entertained most cordially by the Vice-Chancellor of the University, who gave an Evening Reception on June 5th, and by the Lord Mayor of Manchester on June 7th; some very interesting excursions were arranged to see the Swinton House Schools at the invitation of Sir Thomas Shann, the Manchester Children's Hospital and the Crossley Sanatorium, Delamere Forest.

Professor Sheridan Delépine was kind enough to give a demonstration which aroused the greatest interest at the Public Health Laboratory on the methods in use in Manchester for the detection of tuberculosis in milk.

Popular lectures were given each evening at the Pendleton Town Hall by Dr. J. Edward Squire, C.B., Dr. R. W. Philip, of Edinburgh, and Professor G. Sims Woodhead, of Cambridge, which were very largely attended.

The delegates took full advantage of the many invitations that had been so kindly arranged for them.

The Council of the Association desires to record its grateful thanks to all those who were responsible for the organisation of the Conference, and in especial to the members of the Joint Committee, and also for the very hearty welcome accorded to the delegates.

J. J. Perkins,
Honorary Secretary.

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Dr. H. Gordon Smith.

NATIONAL ASSOCIATION FOR THE PREVENTION OF CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

FOURTH ANNUAL CONFERENCE,

MANCHESTER, JUNE 5th, 6th and 7th, 1912.

The Conference opened, for its First Session, at 10 a.m. on Wednesday, June 5th, in the Milton Hall, Deansgate, Manchester.

In the unavoidable absence of the Lord Mayor of Manchester, the delegates were briefly welcomed by Dr. Niven, Medical Officer of Health for the city, who said: I am requested to express the regret of the Lord Mayor that, owing to a Council meeting, he is unable to be present to inaugurate the Conference. I will do no more at present than express our hearty welcome to Manchester of the Conference of this important Association, which has done so great a work in familiarising the nation with the necessity of taking special precautions against the spread of consumption. This part of Manchester, as you know, has been specially afflicted, and Manchester itself is more heavily scourged by tuberculosis than perhaps any other large city in the Kingdom. I am glad to say, however, that the result has been that a very strenuous struggle has for a long time taken place to suppress, as far as possible, the disease.

OPENING ADDRESS.

PREVENTION OF CONSUMPTION.

By E. W. HOPE, M.D.,
Medical Officer of Health for the City and Port of Liverpool.

An invitation to give the Opening Address at the Annual Conference of the National Association for the Prevention of Consumption is, I feel, a very great honour which carries with it obvious responsibilities. The Association is not an old one, and its Annual Conferences have therefore been few, but already they have been distinguished by the patronage and interest of His Majesty the King, and from its very beginning the objects of the Association have had the earnest help of persons interested in every phase and aspect of this many-sided question. Already these Conferences have been the means of amplifying well-proved preventive measures, and of initiating helpful and effective co-operation.

In selecting Manchester as its place of meeting, and the twin-sister Salford as the seat of the Exhibition, the Association has chosen one of those great centres of population whose sanitary activity and foresight furnish an object-lesson in the value of preventive action. The carefully considered and wisely applied preventive measures of those in authority, acting largely under the advice of Dr. Niven and Dr. Tattersall, have placed these cities among the first rank of those in which the gradual decline of consumption is so happy a feature. Twenty years ago Professor Delepine and Dr. Niven had already given a great stimulus to systematic action in the prevention of tuberculosis; at that time, too, the North-Western Branch of the Society of Medical Officers of Health had gone far ahead with its propaganda in the same direction; the seat of this body is in Manchester. The influence of the work of Professor Ransome, as well as that of many others, was also at that time being felt.

The Corporations have throughout continued to show a most progressive spirit, and it is to this that the present position of the city is due. The Sanitary Authority deserves the highest commendation for the work which they have done in the past, and for the manner in which they have attacked every new problem. Conspicuous attention has been paid to the subject of bovine tuberculosis, and the Manchester experiences have, thanks very largely to the work of Delépine and Niven, accumulated a large amount of valuable material in the elucidation of the modes of spread of consumption.

In this country one of the most evident and most satisfactory phenomena of our generation is the great achievement of sanitation in saving and in prolonging human life. With the encouragement of this fact before him no worker need be disheartened nor discouraged. Some forms of disease have practically disappeared : typhus fever is one of them, the decline in many others, more especially in the great centres of population, where sanitation has been most active, is a full reward for the labour and pains and money expended in bringing it about. But the arrest in the ravages of consumption represents a larger saving of human life and all that that implies than does the decline, remarkable as it is, of any, or indeed of all of the other zymotic diseases combined.

For many years preceding our own generation, but more notably within it, year by year, slowly but surely the miserable tide of consumption has receded. This decline has followed closely upon great sanitary operations, undertaken, many of them, without any particular regard to tuberculosis, but directed rather against the sudden and destructive outbreaks of other forms of disease, not only destructive of life, but interfering seriously with commerce and with social development. The consequences of these sudden and violent epidemics forced themselves upon popular attention far more than the destruction slowly and insidiously wrought by the persistent, weary, long-continued epidemic of consumption ; with that the public by long familiarity had become tolerant. The campaign directed against typhus proved effective against consumption also.

We recognise now what was not fully appreciated then, viz. that every measure designed to improve the health of the people is also to a more or less extent a measure directed against tuberculosis.

With some of the measures which have wrought these changes everybody must be familiar. The means of cleanliness—pure and abundant water supply—is surely one: where is the ratepayer who now begrudges the money and the time spent in order to bring from far distant watersheds a supply of water—uncontaminated and unlimited—which can be delivered on every floor of his house, and at a cost only of 1½*d.* per ton? What do all those facilities mean in ensuring personal cleanliness, domestic, and municipal cleanliness?

Equally or even more important are the attempts to ensure purity of the air—suppression of smoke, suppression of that destructive and intolerable nuisance, whose effects, being indirect, are so little realised.

But it is in the improvement in the homes of the people that the most effective changes have taken place.

For half a century or more the knowledge has been extending, and is now almost common knowledge, that purity of the air of occupied rooms, whether they be work-rooms or offices, school-rooms or dwelling-rooms, is the first safeguard against consumption.

It will be conceded that the healthy home is the first necessity; in the endeavour to secure that, every great city, if not every town, is confronted to a greater or less extent with the difficulty associated with the poverty, thriftlessness and indifference which characterise what is known as its lower quarters. The outcome is that many homes become notoriously unhealthy from the point of view of consumption, not because the building itself is vicious in its plan or construction, but because of the way in which it is occupied, the sub-letting; the overcrowding, the insufficient cubic space and consequent foul, vitiated air, as everybody knows, favour the development and spread of tuberculosis.

The proper control of houses such as these is a problem of great magnitude in every large town, and constitutes an extremely important element in the control of tuberculosis. It is not an easy thing to secure to every inmate the theoretical physiological minimum of cubic space; at present it is impossible to do so. All that can be aimed at is to fix the minimum requirement at the highest possible standard which circumstances permit, and to see that the standard is adhered to. This may seem quite a simple matter to those unfamiliar with poverty conditions; to any such, the actual conditions, say, in Dublin, Manchester, Birmingham, Edinburgh, Glasgow, or any similar place are deserving of careful study.

The magnitude of the subject may be illustrated by Liverpool, in which there are to-day some 18,873 houses registered as sub-let, and they house approximately 160,000 people; although they are not structurally insanitary, it has been found necessary to apply to them certain stringent statutory regulations, mainly with a view to prevent what was regarded as objectionable overcrowding, and to ensure some ventilation There was a time when, owing to the inability of the occupiers to pay more than a minimum rent, it was regarded as an absolute impossibility to exact more than 250 cubic feet per adult person, no regard whatever being had to children, who constituted almost one third of the population; with that amount the authority had to be satisfied. The next steps were to raise that standard first to 300 cubic feet, then to 350 cubic feet. I can assure you that the obstacles to be overcome in increasing that allowance were many and great, but eleven years ago the amount was further raised, so that every inmate, adult or child, shall have at least 400 cubic feet if the room is used as a day-room. This meant, of course, diminishing by almost one half, the number of persons originally allowed in each room, thus practically distributing the large population over a wider area. It might be thought that the raising of the standard in this way would lead to hardships, as it put an entirely new construction upon the offence of overcrowding. Happily, such has not proved to be the case; indeed, within twelve months of the amendment of the regulations the population, aided in various ways, with a narration of which I must not detain you, had practically readjusted itself.

A large staff, specially trained and qualified, is employed solely for the purpose of supervising these houses, to visit by night where necessary, and to count the people as they lie in bed. The results of the work of that staff show that during the last ten years there has been a steady and continuous diminution in the offence of overcrowding, a diminution which may be expressed by the statement that against every seven convictions for overcrowding which took place at the police court ten years ago rather less than two occur now. That this work plays its part, and a most important part, in the prevention of consumption, no one familiar with this phase of sanitation questions. The same administrative measures are followed by the medical officer of health of all towns which stand in need of them. What is done in Liverpool is done also in Manchester and Salford and everywhere else.

But there are other types of dwelling which are as closely, if not more closely identified with consumption—the dwellings which, unlike those we have just considered, are structurally insanitary, in which unwholesome condition of occupation is intensified by unwholesome construction. One is the cellar dwelling. In bygone years in Liverpool alone, 30,000 people were housed in cellars, and we cannot suppose that gradual closure of these places has had no effect on tuberculosis. Those which exist to-day tell the story plainly enough, and justify the special legislation obtained by Liverpool, under which no cellars may be legally occupied as dwellings after the close of the present year.

But the most interesting contribution which Liverpool can furnish, if any were really needed, to the linking-up of the dwelling as the cause of consumption, is in the arrangement of insanitary dwellings known as the courts and alleys, which consist of small rows of three-roomed houses, back-to-back and side-by-side with one another, built in narrow courts, to which air and sunshine find access with difficulty, whilst the interiors, having no means of thorough ventilation, were always close, foul and oppressive. The Parks and Gardens Committee humanely endeavoured to brighten these courts by gifts of window-boxes of flowers, but these, in the absence of sunshine, so quickly faded and died that the experiment was discontinued.

Twenty-two thousand of these houses existed in 1864. Thousands of them have been demolished to make way for commercial extensions, and thousands more have been purchased and demolished by the Corporation; suitable cottages for the labouring classes being erected on their sites. More than a million of money has been expended by the Corporation on that work alone.

The construction of these slums, known as court-houses, constituted a gigantic and singularly interesting experiment upon man, the results of which can be clearly traced, because of the close investigations which took place before the grand juries at each successive step in their removal. When the Corporation seriously took in hand the task of ridding the city of these places, the proceedings were taken under a local Act, comparatively slow, costly, and difficult of application. There was no Housing and Town Planning Act to lessen cost and to shorten procedure; the owners, then as now, properly defended their rights, long arrays of counsel appeared to represent these owners when the houses came before the grand jury to be dealt with. It is very fortunate, from the point of view of vital statistics and the prevention of consumption, that this action was taken, because the evidence, adduced as to the prejudicial influence of these places upon the health of the occupants, was subjected to severe scrutiny; evidence, which could not be shaken, was forthcoming that these houses did have, and were having, a serious effect upon the health of the occupiers. Amongst other indictments proved against them was the great prevalence of diseases of the lungs, including consumption, amongst the occupants—a fact which would surprise no one familiar with the fœtid atmosphere of such homes.

Over a series of years, and over large areas of this class of dwelling, it was shown that the mortality from phthisis averaged 4 per 1000 per annum.

The other side of the picture shows, as clearly as anything can, what effect re-housing has had upon the incidence of phthisis. The Committee of the Corporation which was charged with the responsibilities of dealing with this property, in the earlier years met the necessities of the case simply by demolishing it, the people re-housed themselves elsewhere, in vacant properties little, if at all improved in character; but fifteen years ago it was found that very little reasonable accommodation for labourers, near to the docks and other large centres of labour, was available, and the Corporation then decided that its Insanitary Property Committee—as it was then called—should also re-house the people it dispossessed, whereupon the Committee changed its name and its policy to that of a Housing Committee; the areas were cleared, suitable houses were rebuilt on the sites, and—this is the most important fact of all—the tenancy of a large proportion of the new dwellings was restricted to the same families who had occupied the insanitary dwellings, and who had been dispossesssd on that account. Many of these dwellings, which now number nearly 3000, have been occupied for a number of years, and the great fact stands out that, after giving consideration to every point which makes for accuracy, the phthisis mortality is no longer 4 per 1000 amongst these people, but for the last three years has averaged 1·9. Consumption, in fact, has followed, although to a less striking degree, the decline in another disease, viz. typhus fever, which really stimulated the Corporation to action. The disturbance and removal of the breeding-places of typhus fever led not only to the extinction of typhus, but to an enormous and continuous diminution in phthisis.

The preventive measure, therefore, of re-housing, if it rested upon this evidence alone, would occupy a strong position.

Every medical officer of health has to a greater or less degree this housing difficulty to face. Rural as well as urban districts possess it, and the sooner the owners of slum property—whether in town or country—realise the obstacle it is to the prevention of consumption the better for the nation.

The measures of prevention to which I have alluded, and many others equally important, have arisen out of general or local legislation which was not directed specifically against any one form of disease. But during the past twelve or fifteen years the specific work of medical officers of health in relation to tuberculosis has not only greatly developed but has become closer and more direct. New measures, new obligations, new opportunities have arisen, all of which the medical officers of health have seized upon. One authority after another has adopted the voluntary notification of consumption; some by means of private Acts have obtained powers to require compulsory notification. By successive regulations of the Local Government Board the compulsory notification of consumption is in operation throughout the whole country, and its administration, so far as I can ascertain, progresses smoothly, and with nothing but beneficial results. The notification of every case of consumption to the medical officer of health has further extended the opportunities to inquire into the condition of other members of the family, and incipient cases have been brought to light. Notification has been made the basis of important administrative measures. Visits to the homes by medical and health visitors working under the supervision of the medical officer of health have been welcomed.

Not a few sanitary authorities have added to the staff of the medical officer of health a special assistant medical officer specially qualified by training to detect and properly deal with cases of consumption in their various stages. All cases of consumption are referred to him, and this closer supervision enables preventive measures to be more readily applied.

In addition to the personal visits, and the instructions given as to the precautions to be adopted to prevent the spread of infection, cards of instruction have been distributed for the benefit of consumptive persons and of those who live with them, as well as for the general instruction of the public, so that in many, perhaps most, large centres of population, there is not a single patient who has not received one.

Many authorities are in co-operation with the local consumption hospitals, the out-patient departments of which have for a long time discharged the functions which it is now proposed to find means to supplement by kindred institutions, the Anti-Tuberculosis Dispensaries, and to provide these establishments in places where they do not already exist.

Many public health authorities have provided sanatorium accommodation for consumptives, not forgetting the object of training patients in the precautions to be observed against the spread of infection.

Most public health authorities afford free facilities for the expert bacteriological examination of specimens from suspected cases of consumption.

Periodical disinfection and cleansing of the premises occupied by consumptives is provided without cost—a minor point, but of considerable practical value in the homes of the poor.

The recent Regulations of the Local Government Board have empowered local authorities to undertake the home treatment of patients, in addition to their previous powers to provide institutional treatment.

An important branch of the department of the medical officer of health, or linked up naturally and inseparably with it, is the work of the medical inspection of school-children. The extreme value of medical inspection in facilitating preventive measures in regard to tuberculosis is now recognised.

Not only is the tuberculous child under observation, but the condition of the school comes within the purview of the school medical officer, and although, no doubt, at the inception, the suggestions of the medical officer were not always accepted with gratitude, a few years of experience of their value have smoothed away much of the opposition to the sanitation of schools. Always bearing in mind "prevention," is it not of paramount importance that the schoolroom should be the high-water mark of hygiene? It is here that the child passes quite a large proportion of its life, and if the conditions are unfavourable it is more than possible that the predisposition to tuberculosis will arise. Let us have, therefore, ample cubic space for each child, well-lighted, clean, and well-ventilated class-rooms; a teaching *personnel* free from any suspicion of tuberculosis, and a maximum of teaching out-of-doors together with nature studies and physical exercises. It is surely an anomaly to recognise on the one hand the value of the open-air school, and yet, on the other, to refuse to apply the principle as far as possible to all schools.

Nor must we forget two other extremely important administrative measures for the prevention of tuberculosis, namely, the supervision of the milk supply. Surely no subject calls for greater attention than the sanitation of cowsheds. It is a lamentable thing that owing to the inertness of so many rural sanitary authorities, the condition of large numbers of country cowsheds is bad in the extreme. The consequence is that the cows are riddled with tuberculosis, and the milk contaminated. But, one after another, in the absence of general legislation, great towns have actually been forced to seek Parliamentary powers to prohibit the importation into their districts of the diseased products of cows kept in the filthy and insanitary cowsheds of country places, and the fact stands out that the milk from cows kept within the precincts of cities is freer from tuberculosis, and consequently purer and more wholesome, than that coming from many rural districts, with their greater facilities and more healthy surroundings were they only availed of. But it is only the large towns which have these powers, and the milk excluded from these centres finds its way into unprotected communities. Liverpool (following the lead of Manchester) obtained powers of this kind in the year 1900, and it is a fact, the interpretation of which I leave to others, that coincidently with putting these powers into operation two things have followed. One is that the tuberculous milk from the country has largely diminished year by year in amount, and the other is that tuberculosis amongst young children (who are the greatest milk consumers) has diminished also in an almost corresponding degree. The question of the liability of tuberculous milk to cause tuberculosis in children was once a matter of controversy. The Report of the Royal Commission leaves no doubt upon the matter in my own mind.

The history of epidemiology shows how in every instance the amelioration of the great afflictions of the human race has been due to prevention. Plague, smallpox, typhus fever, malaria, consumption, are all illustrations of this; as their causes were appreciated, and as measures to remove them have been put into operation, so has their prevalence been curbed.

The value of relief of avoidable human suffering by treatment and the value of saving and prolongation of human life by its means are too great to be estimated. Our own medical literature of the seventeenth century, for example, so rich in the treatment of smallpox, one of the most prevalent of diseases and the most frequent cause of death in those days, is evidence that the sufferings of many an unfortunate patient were lessened and relieved, but it did little, if anything, to *prevent* the disease. Whilst treatment has saved the life of many a typhus patient, it has profited nothing towards preventing it altogether. So also with malaria, the results of treatment, great as they are, are negligible when contrasted with the achievements of prevention.

But prevention and treatment do on occasion merge into one another; we need have no anxiety that necessity for treatment will be overlooked. The relief of present suffering must always appeal more strongly to humanity than its prevention. Happily, human compassion is easily stimulated; the joy of seeing a patient recovered from a critical illness is a very different emotion to any which can be excited by reading cold records of the results of prevention, illustrated perhaps by uninviting statistics. The visible effect does, as a matter of fact, make a far greater impression than the cause, which may be remote and obscure, and perhaps takes years of patient labour to even unravel, and years more to remove. The one touch of nature which makes the whole world kin will, we may be sure, affect the Insurance Commissioners, and we need have no apprehension that under new developments, measures of treatment will receive less immediate attention than measures of prevention. My own apprehension, indeed, is rather that the reverse may happen.

Towards the close of February a Committee was appointed by the Lords Commissioners of His Majesty's Treasury "to report, at an early date, upon the consideration of general policy in respect of the problem of tuberculosis, in its preventive, curative, and other aspects, which should guide the Government and local bodies in making or aiding provision *for the treatment of* tuberculosis, in sanatoria or other institutions, or otherwise." The Committee, wisely chosen and experienced, felt the difficulty of reporting upon so wide a reference in a limited time, and they make it plain that the Report which they submit shall not be taken as the final expression of their views upon the problem in all its details. Nevertheless, there are some bedrock facts which receive general acceptance, and all who have studied the report will agree that it contains elements which are likely to be extremely useful. One hears very little adverse criticism of the proposals indicated in the Committee's Interim Report, the sentiment apparently being that the work indicated ought to be done, the uncertainty being, who is going to pay for it ?

It is significant that before considering the aspects of *treatment*, with which the Committee are specifically asked to deal, there stands out conspicuously and in the forefront of their Report the commandment that "any scheme which is to form the basis of an attempt to deal with the problem of tuberculosis should provide that those means which experience has proved to be most effective should be adopted for the *prevention of the disease*." The paramount importance of prevention, in order to rid the country of this curse, is here endorsed by the Committee, endorsed by the Local Government Board, and their phrase brings to the imagination the long train of preventive measures, firmly established, proved and tried, but simplified and rendered more easy of application, as the Legislature has moved forward in conformity with educated public opinion. I emphasise this because there appears to be reason to fear that public attention may again be temporarily diverted from the necessities of prevention to the expectations, often illusory, of the hopes of cure. I use the word "public" attention in contra-distinction to official or expert attention. Public opinion controls progress; it is impossible for any sanitary authority to advance without a sound educated popular sentiment at the back of it. Popular attention does not always, or indeed often, make nice distinctions, and any report or action which instilled into the public mind belief that tuberculosis dispensaries, valuable as they undoubtedly may be, will redeem the district from consumption, and that preventive measures occupied a second place, would be disastrous. No progressive community is slow to recognise, and to avail of, all accessory measures, and many sanitary authorities have already travelled far in the direction to which the report now points—so far, some of them, as for the moment to be out of view.

The National Insurance Act, 1911, contains provisions from which great benefit will result, and affords opportunities which the nation has not hitherto possessed to render the struggle against tuberculosis more effective; but it must not be looked to as comprehending or revising the mass of sanitary legislation which has preceded it. While its main object is treatment, yet coincidently it deals in the broadest manner with the powerful preventive agency, Education. The provision of means of further and closer scientific research into the mysteries of this many-sided problem must be universally welcomed. But education of quite another kind—popular education—can also be facilitated; there is no greater mistake than the supposition that intelligent popular interest cannot be roused in health matters. None who had the good fortune to visit the great International Exhibition in Dresden last year could fail to be impressed by the great interest which it excited, not only amongst the community, highly educated as the German people are, but it attracted many thousands of foreign visitors. The influence of an exhibition of this kind will be felt far and wide. It affords an opportunity to people to help themselves, and just in proportion as they do help themselves progress will be made. Sanitary authorities and their officers, however energetic and progressive, have their limitations, and, broadly speaking, can only supply one half the motive force; the people themselves must supply the other half. Nor are the minor tuberculosis exhibitions and travelling shows in this country without their influence. The recent sequence of events in Ireland, where educational methods have been very largely put into operation by Her Excellency the Countess of Aberdeen, is particularly interesting and encouraging in this connection. The Registrar-General for Ireland, Sir William Thompson, attributes the remarkable decline of phthisis in Ireland during the last half dozen years very largely to this action, and he places in the forefront the improvements of the domestic conditions; in other words, the preventive measures comprised under the term, "Personal and Domestic Hygiene and Sanitation," brought to the notice of the people by educational means. Every great centre should have its permanent health exhibition, containing, in forms attractive and easily understood, full and complete illustrations of every one of the great schemes employed in sanitation and the results they have effected. The people would quickly learn the value of these works, and sanitary reformers would have an easier time than they have now. We must remember that the improving education of the people, their more adequate ideas of comfort, the higher wages affording them the means of more healthy living, are powerful factors in promoting health.

The invaluable work done for so many years by the out-patient departments of consumption hospitals emphasises plainly enough that most districts will be the better off when greater facilities are arrived at for early and more accurate diagnosis; want of funds alone has limited their usefulness. Indeed, the suggestion that new dispensaries may lead to the discovery of unsuspected tuberculosis rests upon a very sound basis, the experience of existing dispensaries, out-patient departments and other agencies having for years borne this out.

It is not without regret that we see our old friend the sanatorium relegated to the background to make room for a new favourite; that it should be lifted off the lofty pedestal on which it was placed by undiscerning enthusiasm and by promises incapable of fulfilment is but natural, yet it occupies a position of extreme usefulness which everyone is beginning to understand, and all will cordially agree with the sentiment of the Committee that a large proportion of cases, both of pulmonary and non-pulmonary tuberculosis, will benefit by a stay in such an institution, and many of us would go much further and say that not only they, but the public, will benefit also by the removal of possible foci of infection. The analogy between the sanatorium—using the term in its limited sense and not in its extended definition—the analogy between it and the ordinary fever hospital, is exceedingly close, and the time has already come when we recognise that there are many sufferers from pulmonary tuberculosis who ought in the general interests to be treated in sanatoria, and if necessary compulsorily removed and detained there, for exactly the same reason that it is sometimes necessary to compulsorily remove and detain a fever patient. Apart from the invaluable preventive uses of the sanatorium, there is also the value of sanatorium treatment, so admirably put forward in the useful little memorandum written for the Welsh National Crusade by Sir Clifford Allbutt, Sir Lauder Brunton, Sir William Osler, and Dr. Arthur Latham.

There is little room for doubt that one of the reasons why the sanatorium failed to reach its proper sphere of usefulness was the extravagance of the expectations raised by its earlier advocates; these led inevitably to the disappointment of the patients and their relatives; a swing of the pendulum resulted, a distinct setback in popular favour was given to the sanatorium, which undoubtedly has an important auxiliary part to play in the prevention of tuberculosis.

But we must not forget that disappointment to patients was not the only discouragement which resulted from the extravagant pretentions put forward; at one time they imperilled the continuance of the really important preventive measures by diverting attention from them. Sanitary authorities have not got unlimited money to spend on the prevention of disease; what is available must be spent effectively. If, instead of spending the money in improving the dwellings of the people and in other preventive measures, they had spent it on the provision of sanatoria, the various sanitary authorities would have been in possession of magnificent sanatorium establishments on the one hand, fed by undiminishing insanitary conditions on the other.

In conclusion, let me say that sanitary authorities must welcome every measure directed to the prevention of consumption, because they know perfectly well that their value will not be confined merely to that one particular form of disease.

Just precisely as sanitary authorities thirty or forty years ago in their fight against typhus fever were vigorously combatting tuberculosis without being aware of it, so preventive measures directed specifically against tuberculosis will also be effective against other forms of disease.

National effort has a great ally in this National Association for the Prevention of Tuberculosis. It is a powerful association, it has great ambitions, it has a leader of men as its President, and what is scarcely of less importance, it has millionaires as its treasurers. The public expect great things from it, and they will not be disappointed.

The Chair was then taken by Professor Hope.

SECTION I.

TUBERCULOSIS IN CHILDHOOD.

THE PRESENCE AND PREVALENCE OF TUBERCULOSIS IN CHILDHOOD.

By R. W. PHILIP, M.A., M.D., F.R.C.P.E., F.R.S.E.

Dr Philip introduced his paper as follows: It is a fortunate circumstance that this great Association meets in the city of Manchester. Nowhere has more effective work been done, or for a longer time, in the direction of the scientific prevention of tuberculosis than in this city. I need only cite the names—though I might cite many—of Ransome, Delépine, and Niven, to justify this statement. I feel sure that whatever we may carry away from the discussions which may take place in this hall, we shall all of us benefit, more than I can venture to describe, by what we shall see of the practical work in the laboratories of these men—a work which will through all time be associated with their names.

In acceding to the request of the Committee that I should say something introductory to a discussion regarding the occurrence and prevalence of tuberculosis in childhood, I shall endeavour to place before you very briefly one or two thoughts which I trust may prove suggestive.

The past thirty years have seen frequent changes of front towards the tuberculosis problem. None of these is of greater interest or fraught with more practical significance than that which has determined attention to the ætiological relationships of childhood to tuberculosis. The older conception which centred thought on the period of adolescence and early adult life is giving place to the belief that the tuberculosis of these periods is, in greater part, the harvest of seed sown in childhood. If this be so, it is manifest that the most hopeful line to be prosecuted in relation to the prevention and eradication of tuberculosis is the study and detection of its earliest manifestations in the child.

If any lesson be written large as the result of the common failure in time past to treat the problem effectively, it is this, that we have looked in too exclusive a fashion at the completed picture of advanced visceral disease and have thought too little of the successive stages leading from inoculation slowly up to this. This is true of the successive stages of tuberculosis at all periods of life. It is especially true in relation to the progress of the infection in the developing child.

NATURAL HISTORY OF TUBERCULOSIS.

Tuberculosis is a process of sluggish, insidious spread. The actual point of inoculation may present little or no determinable change. The gradual extension by way of the lymphatic system has escaped notice for the most part. Observation has been drawn to this only when disfigurement has occurred through gross enlargement of one or other gland or group of glands, or when suppuration has supervened.

Take, for example, the frequent case when tuberculosis enters by way of the tonsils and adjacent glandular structures. The subsequent passage of infection follows the line of the chain of lymphatic ducts and glands. The glands undergo a process of infiltration which involves individual glands successively from above downwards. Yet attention has been little directed to the glandular involvement save in those instances where grosser enlargement of one or more has taken place, associated with caseation or suppuration. Under ordinary conditions for the most part, the less evident but uniform spread of infection from gland to gland is missed. It is the accidental determination of suppuration at one point which generally arouses attention. Yet in the former case a subtler, although less obvious, form of infection is in progress.

Whether inoculation has been effected in the tonsillar region or the intestine, or at some other point of the mucous surface, the process of spread in the majority of cases is similar, namely through the adjacent lymphatic system. Wherever it be, if the glandular change be relatively slight and correspondingly out of sight, the fact of inoculation is constantly overlooked until the advent of definite symptoms indicates that some organ of importance has been attacked.

In this sense a significant analogy may be traced between the natural history of tuberculosis and of syphilis. In both cases the initial phenomena of inoculation and early spread through the lymphatic system are similar. In each case the fact of inoculation may be missed until its presence becomes evidenced by grosser visceral disease.

Watchfulness Needed.

I know no subject of greater interest than the observation of the changes which occur from week to week and month to month and year to year in the young child who has become infected by tuberculosis. I have watched them again and again from the stage of minor involvement of a few glands to that of disintegration of lung or other visceral tissue. My belief is that if child life were watched with sufficient care and with sufficient suspicion in respect of tuberculosis, we should be in a position to anticipate and prevent most of the doleful harvest. If it be true, as I have no manner of doubt it is, that tuberculosis is much the commonest disease of child life, there seems need of a more general awakening of suspicion as to its presence amid the varying symptoms of disease in childhood. And the need is no less for careful study, both clinical and pathological, of the course of tuberculosis in the child, so that mere suspicion may be changed into scientific diagnosis.

Evidence as to Prevalence.

As to the immense prevalence of tuberculosis in childhood there can be no reasonable ground for doubt. Statistics on the point, based on exact observation—clinical, pathological and experimental—have been forthcoming from many sides.

A. *Clinical Evidence.*

The clinical evidence is strong. There is a consensus of opinion that congenital tuberculosis is rare. Even with tuberculous parents the child is very seldom born with tuberculous disease. Whether the parents are tuberculous or healthy, the occurrence of tuberculosis in the child during the first six months of life is relatively infrequent. From that date onwards the frequency of tuberculosis increases steadily.

A number of years ago I submitted the statement, based on personal clinical examination of different groups of children of school age in Edinburgh, that at least 30 per cent. presented definite evidence of tuberculosis. With greater latitude in the interpretation of clinical signs the percentage would have been considerably greater. Later observations on the same lines, combined with the use of the tuberculin test, have satisfied me that the figure I have quoted was within the truth.

The evidence obtained from the system of the "march-past" of households, introduced by the tuberculosis dispensary, is striking. It is not uncommon to discover during one such examination signs of tuberculosis in three, four or five children from the same home.

Since the introduction of the tuberculin cutaneous tests, a considerable series of observations have been reported from different countries which all tend to the same conclusion, namely, that tuberculosis exists, and can be determined individually, in the majority of school-children.

The figures of von Pirquet, Ganghofer, Hamburger, Monti, Franz and Calmette go to show that in their respective cities most children among the working-class population have been tuberculised by the time they reach the age of fifteen. Nor is the statement referable merely to the children of large cities. The observations of Franz included the examination of 400 young soldiers—apparently healthy recruits, who had passed the ordinary physical examination for the service—and among these he found that 61 per cent. gave a positive reaction to the tuberculin test.

B. *Pathological Evidence.*

The pathological evidence is no less clear. Twelve years ago, Naegeli, of Zurich, reported that he had found definite signs of tuberculosis in no fewer than 97 per cent. of all bodies examined consecutively by him post mortem, *i.e.* of persons dying from different kinds of disease and accident. On such facts was based the well-known aphorism, "Am Ende hat jedermann ein bischen Tuberkulose" ("Sooner or later everybody gets a touch of tuberculosis").

But the true inwardness of the observation was discovered only when more careful attention was directed to the post-mortem examination of children. Hamburger has reported the results in two separate groups. The first series included 401 children, of whom 63 per cent. of those between seven and ten years of age showed evidence of tuberculosis, and 70 per cent. of those between eleven and fourteen. The second series included 848 children. Of those between seven and ten years of age 63 per cent. were found to be tuberculous, and 70 per cent. of those between eleven and fourteen. Deducting from the 848 those who had actually died from tuberculous disease, it was determined that of the remainder between eleven and fourteen years of age no fewer than 53 per cent. had tuberculous lesions. Of special interest is the fact that in this series the frequency of tuberculosis steadily increased from 17 per cent. in those of two years of age to 53 per cent. in those between eleven and fourteen.

It is a point of much significance that during recent years, with increased refinements of methods, the number of children found to be tuberculous on post-mortem examination has steadily grown.

C. *Experimental Evidence.*

Experimental research has shown that tuberculosis is of still more frequent occurrence than clinical and pathological observations had been able to determine. It has proved that various conditions in which it had not been possible to discover characteristic appearances either at the bedside or post-mortem table were nevertheless of tuberculous nature. This has been determined in the case of young children, in whom no definite tuberculous lesion could be discovered by the ordinary means, in life or post mortem, with the exception of multiple infiltration of cervical and other glands. From these glands—in the absence of microscopical appearances of tubercle—it has been found possible to prepare an extract, which, when injected into guinea-pigs, has produced tuberculosis.

From all this it will be seen that we are confronted by the fact that tuberculosis is vastly common in childhood. Most children take it one time or another. The child's mucous membranes are specially receptive and absorbent. Inoculation occurs readily at any point. The extent of spread depends chiefly on the child's vitality or the resistance offered to the invading organisms by its living cells. This, in turn, is influenced largely by the character of the child's compulsory environment.

Other things being equal, the younger the child the more easy seems the dissemination of the virus throughout the lymphatic system. The frequency of infection increases in each successive age-group. This is, doubtless, due to the continued, repeated opportunities for infection.

While with advancing childhood the frequency of infection increases, the morbid process progresses as a rule more slowly. Individual subjects differ much in this respect, but, other things being equal, the older the child the greater is his resistance. With increasing years the frequency of apparently arrested tuberculosis, *e. g.* in the form of calcified glands and scars, becomes noteworthy. Whether such arrest contributes in any degree to immunity is a difficult question. Some facts point in this direction. It is possible that some degree of immunisation is established thereby. If so, it is comparatively slight and fleeting. In presence of continuous exposure to, or a massive dose of, infection, the immunity readily gives way, and the progress of disease tends to be rapid.

SCIENTIFIC OUTLOOK.

In this necessarily brief presentation of the subject I have advisedly dealt with the incidence of tuberculosis in the scientific sense. I am concerned not merely with children, whose infection is clinically easy of recognition, but likewise with those in whom the infection may be so slight as to have little more than potential significance.

It disturbs me no wise to be told that this conception of tuberculosis is of academic rather than practical value. If we are to understand tuberculosis aright, if we are to form a true judgment on the practical issues of the tuberculosis problem, we require to know the facts with all the exactness of which scientific medicine is capable. We require to keep in view the unity of tuberculosis in its extraordinarily varying manifestations. We must get rid of the artificial distinction between so-called medical and surgical tuberculosis. I would remind my critic that from the practical, no less than from the scientific point of view, the most slender seedling of tuberculosis is potentially as significant as the full-grown tree. It is impossible to say with any certainty which tuberculous weed will be cast off and which will mature.

The usual outlook on this great question calls urgently for readjustment. The existing system of medical examination of school-children for tuberculosis, however serviceable it may be from the administrative point of view, is entirely misleading as regards the incidence of tuberculosis in children. By admission, the returns have reference to obvious cases of disease, and have no ultimate scientific value. It is the much slighter degrees of infection which especially merit study. The natural history of the disease is readily followed in the child. The beginnings of the morbid life-history call for minute observation, not only for the child's sake, but, in the largest sense, for the sake of the nation and the race.

For here, no less than in other ways, the child is the father of the man. It is the seed lightly sown in childhood that for the most part determines the occurrence and course of tuberculosis in later life.

The Problem of Prevention.

If the thought be staggering, it is likewise stimulating. For successful implantation of tuberculosis the soil must be in a suitable state and the live seed must be present in sufficient amount for a sufficient length of time. Fortunately the conditions which are most favourable to the healthy, vigorous development of the species—indeed, the conditions desirable, if life is to be more than existence—are conditions which are unfavourable to the tubercle bacillus.

Why, then, this almost universal distribution of tuberculosis among the young of the race? The answer brings us to the bedrock of physiological truth and gives the key to the problem of prevention. Recall present procedure in the rearing of children. In a vain endeavour to protect him from harm the child is clumsily removed from the beneficent ministrations of Nature. The vital atmosphere is replaced by one which is obviously—to the undulled sense—of human provision. Sunlight is obscured by shade of every kind and degree. Nutrition is frequently mismanaged, and natural movement and development impeded by a multiplicity of restraining bands. The process of devitalisation thus inaugurated is maintained from week to week and month to month. The infant is prepared for successful invasion by infections of all kinds. Continuously in the unwholesome environment, he falls a prey especially to the tubercle bacillus, by whatever channel it may be introduced. For unhappily the conditions which are inimical to the life of the child are essentially those favourable to the tubercle bacilllus.

The child who has been thus tuberculised is doubly significant, because of what he is and because of what he may become. The tuberculosis of a people begins in the nursery and in the school-room. It is to the nursery and school-room that observation and effort should be directed, if measures for the eradication of tuberculosis are to be fundamentally sound and practically effective.

The problem of tuberculosis in childhood will not be solved by the erection of hospitals or homes for cripples and sick children. These have their immediate, temporary significance. But beneficent as is their purpose, and splendid as their results have been, they do not carry us far enough. The essential question is not how to tinker up diseased frames. The issues involved are much wider. The problem can only be solved effectively by a better understanding of the physiological needs of developing life and a corresponding renovation of the nurseries and school-rooms of the nation.

It is folly to dream of transferring all cases of tuberculosis, whether in the child or the adult, to sanatoria and hospitals. To propose this is to plead ignorance of the essential needs of the problem. The purpose is as unnecessary as it is impossible. The great value of the tuberculosis dispensary lies in this—that it goes to the heart of the problem in the household and meets every issue. While caring for the individual in whatever way may be needful, the dispensary regenerates physiologically the dwelling, however humble. It makes the home of the poor man become the nursery of healthy children and cease to be the breeding-ground of tubercle-tainted wastrels. Each re-created home is an effective preventorium against tuberculosis.

THE SHARE TAKEN BY HUMAN AND BOVINE TUBERCULOUS PRODUCTS IN THE INFECTION OF YOUNG CHILDREN.

By SHERIDAN DELÉPINE,
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(1) Introductory Remarks: Unity or Duality of Tuberculosis occurring in Man and in Cattle.

The fact that interest is now shown in the share taken respectively by human and bovine tuberculosis in the infection of young children is very significant.

It is a sign of recovery from the serious disturbance which had been caused in 1901 by the late Professor Koch's pronouncement at the Congress on Tuberculosis held in London.

Between the years 1865 and 1901, clinical and experimental evidence had slowly and intermittently accumulated, indicating that tuberculosis could be communicated from man to cattle, and from cattle to man. Professor Koch himself had in 1882 contributed to the establishment of this doctrine, by finding in bovine tuberculous lesions bacilli which at that time he considered to be of the same species as those found in human lesions.

This view was in 1884 challenged by Dr. Klein of London, who said that he could not accept the statement that the bovine tubercle bacilli were identical with the human tubercle bacilli. Dr. Klein based this opinion upon the size, shape and distribution of the bacilli. Stronger evidence of the duality was in 1896 and 1898 brought forward by Theobald Smith in America. The views of these observers did not, however, materially influence the opinion of a small number of bacteriologists and hygienists, who continued to urge the necessity of protecting human beings against bovine tuberculosis.

But when Professor Koch stated in 1901 that bovine tuberculosis was not communicable to man to any material extent public opinion was seriously shaken.

Nevertheless, the powers which we had obtained in 1899 under the Manchester Milk Clauses continued to be exercised. This preventive work has progressed steadily up to the present date, with the result that the quantity of tuberculous milk reaching Manchester has been reduced to about one third of what it was fourteen years ago; in addition to this there has been also a considerable reduction in the quantity of bacilli present in the milk which is still infected.

This reduction in the infective power of the milk has been brought about by the removal of cows with advanced tuberculosis of the udder. I will discuss later the effects which this change has had upon infantile mortality from tuberculosis.

Contrary to the opinion expressed by Professor Koch, the findings of a great number of observers who have worked during the last ten years have conclusively shown that bovine tuberculosis must be considered a source of danger to man, and more specially to infants.

It is true that several observers believe that there are essential differences between human and bovine tuberculosis, but they admit that man is liable to both forms of the disease, this view has lately been endorsed by the Royal Commission on Tuberculosis in their final report.

In this report it is stated that by means of the cultural and pathogenic properties of the bacilli isolated from tuberculous lesions occurring in man it is possible to determine whether the source of infection of a patient is bovine or human.

I will refer to this point again when I discuss the evidence we have as to the relative share taken by bovine and human sources of infection in the production of tuberculosis in children.

(2) CHANNELS OF TUBERCULOUS INFECTION.

I must now refer to another aspect of the problem. When Villemin proved in 1865–1866 that tuberculosis was infectious he demonstrated that the disease was inoculable, but he did not show experimentally what were the usual channels of infection; he, however, expressed clearly the view that tuberculous sputa, fresh or dry, were the most important sources of infection of the lungs.

Chauveau, in 1868, demonstrated the possibility of infection through the alimentary canal, and, soon afterwards Gerlach, proved that tuberculous cow's milk was capable of producing tuberculosis in animals fed with it.

On the other hand, Tappeiner, in 1877, succeeded in infecting eleven dogs by exposing them to air infected with diluted tuberculous sputa in the form of a fine spray. Other dogs fed on food infected with the same sputa did not become tuberculous.

Several observers, including Koch, confirmed Tappeiner's experiments, and from 1882 to 1895 infection through the intestine ceased to attract general attention. Some observers, however, did continue to study the question.

It was in 1891, that is, during what I may call the *inhalation theory* period, that I began the investigation on infection through the alimentary canal which formed the basis of our work in Manchester, at that time I found it very difficult to convince hygienists and clinicians generally of the dangers of infection through the alimentary canal associated with the consumption of tuberculous milk.

In 1903, that is, twelve years later, von Behring produced a great sensation when he not only affirmed that infection through the intestine was an important factor in the spread of tuberculosis, but also that pulmonary tuberculosis was generally the result of intestinal infection during infancy. Von Behring received in 1905 support from Calmette, who went even further, and said that adults as well as infants were generally infected through the alimentary canal.

(3) Essential Facts regarding Tuberculous Infections.

The opinions to which I have referred are not all of the same importance from a practical point of view, yet in order to obtain complete control over a disease it is necessary to have full knowledge of all the factors which contribute to its occurrence.

Everyone engaged in the work of prevention must therefore aim at obtaining as complete a knowledge as possible of the various factors he has to contend with.

With that object I have in the course of the last twenty years made a large number of experiments and observations, which have led me to adopt certain definite views.

Before beginning this course of experiments I had devoted more than ten years to the clinical and pathological study of tuberculosis in man, and paid special attention to aërial infection, and pulmonary tuberculosis. My present opinions are therefore the result of some thirty years of study.

I cannot refer to my own work in detail, but I may say here that I have satisfied myself by numerous feeding and inoculation experiments that various animals, including calves, pigs, dogs, cats, rabbits, guinea-pigs, can be infected, though in various degrees, and not invariably, with tuberculous products obtained from human beings and from cattle, and that in an animal like the guinea-pig, which is almost equally affected by bovine and human bacilli, the course of the infection and the characters of the lesions produced by both kinds of bacilli are very similar. I have also satisfied myself that by exposing various animals to air loaded with tuberculously infected dust composed of particles having a definite structure, it is possible to cause some of these dust particles to penetrate not only into the air-passages, but also into the pulmonary alveoli, where they can be recognised and seen to cause marked local irritation and tuberculosis.

Most of these experiments have been performed for my own information, and but few have been published; it is on the basis of experience so gained that I feel justified in accepting or rejecting some of the views which have been advanced.

As some of the divergences which have occurred among experts regarding some interesting details may give rise to general doubt in the minds of those who are not familiar with the objects which bacteriologists have in view, it is important to remember that as regards the most important facts there is almost general agreement.

I may sum up as follows the views held as to the transmission of tuberculosis, and which appear to me justified by facts:*

(1) Tuberculosis may be conveyed from man to man.

(2) Tuberculosis may be conveyed from cattle to man.

(3) Tuberculous sputa constitute the most important source of infection of human origin.

(4) Tuberculous sputa, when dry and reduced to dust (or in the shape of fine particles projected from the mouth of consumptive persons when they cough), are usually conveyed to the infected person by the air.

(5) Tuberculous material suspended in the air can penetrate through the air-passages into the lungs, which may be thus primarily infected.

(6) Infective material conveyed by the air may also pass into the alimentary canal and cause infection through that channel.

(7) Tuberculous cow's milk constitutes the most important infecting material of bovine origin.

(8) The alimentary canal is the usual channel through which infection is conveyed by food.

(9) Whatever the channel of infection may be, bacilli sooner or later pass into the lymph and blood-streams and give rise to tuberculosis in various parts of the body.

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* In this paper I deal only with human and bovine sources of tuberculosis occurring in man.

(10) Localised tuberculosis of the lymphatic glands, bones, peritoneum, pleura, liver, spleen, genito-urinary and nervous organs when not associated with pulmonary tuberculosis are due to infection through the alimentary canal in a material proportion of cases.

(4) EVIDENCE INDICATING THE SOURCE OF TUBERCULOUS INFECTION.

The evidence which is now available for the purpose of estimating the share taken by bovine infection in the production of infantile tuberculosis falls under various heads:

(1) Clinical evidence.

(2) Post-mortem or anatomical evidence.

(3) Bacteriological evidence, based—

A. On the character and properties of the bacilli.

B. On differential tuberculin reactions.

(4) Statistical evidence—A. Mortality at various ages; B. Effects of preventive measures on mortality.

(5) Experimental evidence, bearing on the mode of spread in the lower animals.—This evidence is only indirect as regards man and I will not discuss it here although I attach great importance to it.

(1) *Clinical evidence.*—There are some cases on record in which the history of the illness points more or less clearly to infection by cow's milk, but the interval which elapses between the time when the disease is detected, and that when the infection is supposed to have taken place, makes it generally difficult to obtain absolute proof of the relation between the supposed cause and the effect. It is also practically impossible to exclude other sources of infection.

Some hospital statistics published by Dr. John Thomson, of Edinburgh, in 1907, and by Dr. David Bovaird, of New York, in 1908, have a distinct bearing upon this point. I will refer only to the incidence of abdominal tuberculosis and tuberculous meningitis in children admitted between the years 1897 and 1906 to three hospitals—Great Ormond Street, London; Sick Children, Edinburgh; and Sick Children, Glasgow.

The gross results are as follows:

Total number of children treated	47,030
Number affected with abdominal tuberculosis	1,327 = 2·8 per cent.
Number affected with tuberculous meningitis	769 = 1·6 per cent.

Most of the cases of abdominal tuberculosis and tuberculous meningitis are probably attributable to infection through the alimentary canal. In these statistics tuberculosis of glands, of bones and articulation are not referred to.

(2) *Post-mortem evidence.*—In the same paper Bovaird refers to the post-mortem evidence which has been collected in Great Britain in the course of some twenty years by Carr, Woodhead, Guthrie, Still, Ashby, and Shennan.

This evidence may be summed up as follows:

Total number of post-mortem examinations of tuberculous children	1161
Number of cases of primary intestinal tuberculosis	236 = 20·3 per cent.

According to this estimate, 20·3 per cent. of all fatal cases of tuberculosis in children were in all probability infected through the alimentary canal, and presumably by food. This does not include the cases of food infection, in which the distribution of the lesions did not clearly indicate infection through the intestine. Nor does it indicate the number of cases in which there had been infection without fatal result during childhood.

(3) A. *Bacteriological evidence.*—In the final report of the Royal Commission on Tuberculosis there is a record of an investigation into the characters of the bacilli isolated from various tuberculous lesions obtained from 108 cases of tuberculosis other than lupus. The bacilli found were classified according to the method adopted by the members of the Royal Commission.

The results of this investigation may be summed up briefly as follows:

Bacilli of the human type found in the lesions in	84 cases.
,, ,, ,, and of the bovine type found in the lesions in	5 ,,
,, ,, bovine type found in the lesions in	19 ,,

In 19 out of the 24 cases in which the bovine type of bacillus was found the primary lesions were connected with the alimentary canal.

This investigation would, *if the characters of the bacilli can be accepted as sufficient proof of their source,** indicate that in 22 per cent. of persons dying before the age of fifteen from tuberculosis of various organs, there was evidence of infection by tuberculous products of bovine origin, and that in most of these cases (19 or 20 out of 24) the channel of infection was the alimentary canal.

B. *Differential cutaneous tuberculous reaction.* — In 1907 Ladislaus Destre suggested a modification of Von Pirquet's cutaneous method. This modification was based upon the degree of reaction produced respectively by filtered cultures of bovine and of human tubercle bacilli under certain conditions. According to this observer more than 90 per cent. of cases of pulmonary tuberculosis show a predominance of human reaction, while from 30 to 50 per cent. of cases of visceral and surgical tuberculosis show a predominance of bovine reaction. I simply state these results, without commenting upon them.

(4) *Statistical evidence :* A. *Mortality from phthisis and tuberculosis other than phthisis at various ages.*—Although pulmonary tuberculosis may be caused by infection through the alimentary canal, it is reasonable to believe that no other organ is liable to be primarily infected through the air to the same extent as the lung, and it may be assumed that the number of deaths caused by pulmonary tuberculosis or phthisis indicates, roughly, the possible frequency of aërial infection and consequently of infection of human origin. (Aërial infection of bovine origin is also possible but obviously of slight importance as compared to infection of human origin.)

On the other hand, deaths from tuberculosis of other organs than the lungs may be taken to indicate roughly the possible frequency of infection through food, notwithstanding the fact that infection through the alimentary canal may in a certain proportion of cases be the result of the penetration into the mouth or nose of tuberculous dust conveyed by the air or of tuberculous products other than food.

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* I simply state the case without discussing the value of the characters adopted by the members of the Commission as indicative of the existence of two kinds of bacilli.

If these suppositions are correct the mortality from tuberculous diseases other than phthisis should be greater than the mortality from phthisis in young children. The reverse should be true when tuberculous food becomes less important and exposure to many sources of infected dust becomes more frequent. This method of reasoning is not without fallacies; thus the children of careless tuberculous parents are exposed from the time of birth to aërial as well as to food infection. It may also be urged that when children recover from the first effects of intestinal infection they frequently die of phthisis at a later stage of life.

These sources of fallacy being kept in mind one may hope to obtain some useful information from a study of the mortality from phthisis and from tuberculosis other than phthisis at various groups of ages.

In order to obtain sufficiently large figures I have abstracted certain returns from the supplement to the Sixty-fifth Annual Report of the Registrar-General, which is the last decennial supplement published.

At page 3 we find the following data for England and Wales:

			Annual death-rate per 1000.
Mean population 1891–1900		30,643,479	
No. of deaths (persons) 1891–1900, from all causes		5,575,375	18·19
From tabes mesenterica	66,381		
From other tuberculous and scrofulous disease	123,401		
From tuberculosis other than phthisis		189,782	0·62
From phthisis		426,224	1·39
From all forms of tuberculosis		616,006	2·01

These figures show that on an average tuberculosis other than phthisis is responsible for a little less than one third of the total number of deaths attributable to tuberculosis.

They seem to indicate a preponderance of cases, probably due to aërial infection, over cases possibly due to food infection. The returns become more significant when one studies the relative importance of the two groups of fatal tuberculous lesions at various ages. The general facts bearing upon this point are given at pages cxi and cxiii of the supplement (already quoted); I have analysed them in the following table:

TABLE I.—*Annual Mortality from Tuberculosis per Million Persons living at all Ages and at Eleven Groups of Ages during the Decennium* 1891–1900, *England and Wales.*

	Tuberculosis, all forms.	Phthisis.	Tuberculosis other than Phthisis.
All ages	2010	1391	619
0 to 5 exclusive	3930	413	3517
5 „ 10 „	724	206	518
10 „ 15 „	669	368	301
15 „ 20 „	1396	1144	252
20 „ 25 „	1936	1730	206
25 „ 35 „	2302	2135	167
35 „ 45 „	2742	2592	150
45 „ 55 „	2492	2362	130
55 „ 65 „	2007	1881	126
65 „ 75 „	1263	1154	109
75 and upwards	512	437	75

The facts brought out by these figures are shown clearly in Diagram I.

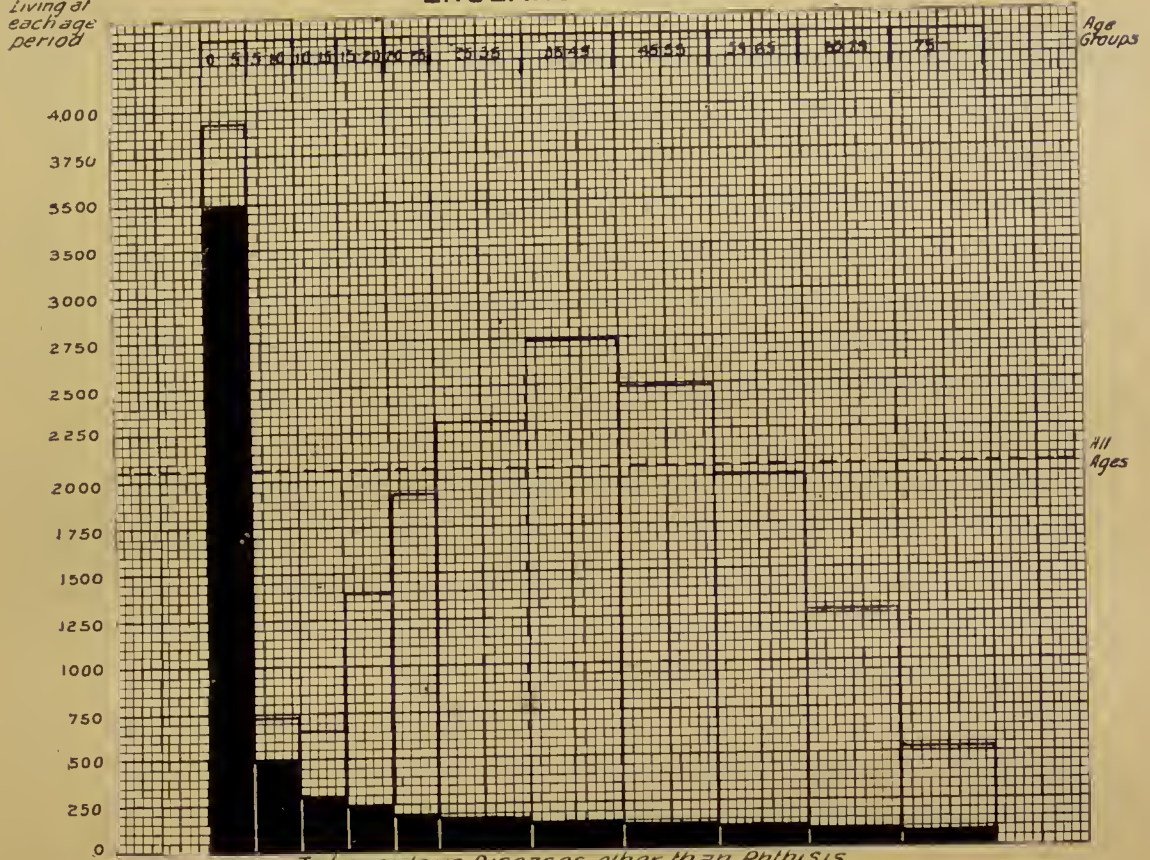
Table I shows that with regard to children under five years the average yearly mortality from all forms of tuberculosis was at the rate of 3930 per million, which is considerably above the mortality rate from tuberculosis at all ages (2010 per million) and at any age above five. This would indicate that before the age of five certain factors particular to childhood are at work.

The table also indicates that there was a marked difference in the relative importance of phthisis, and of tuberculosis other than phthisis, before and after the tenth year of life; the difference

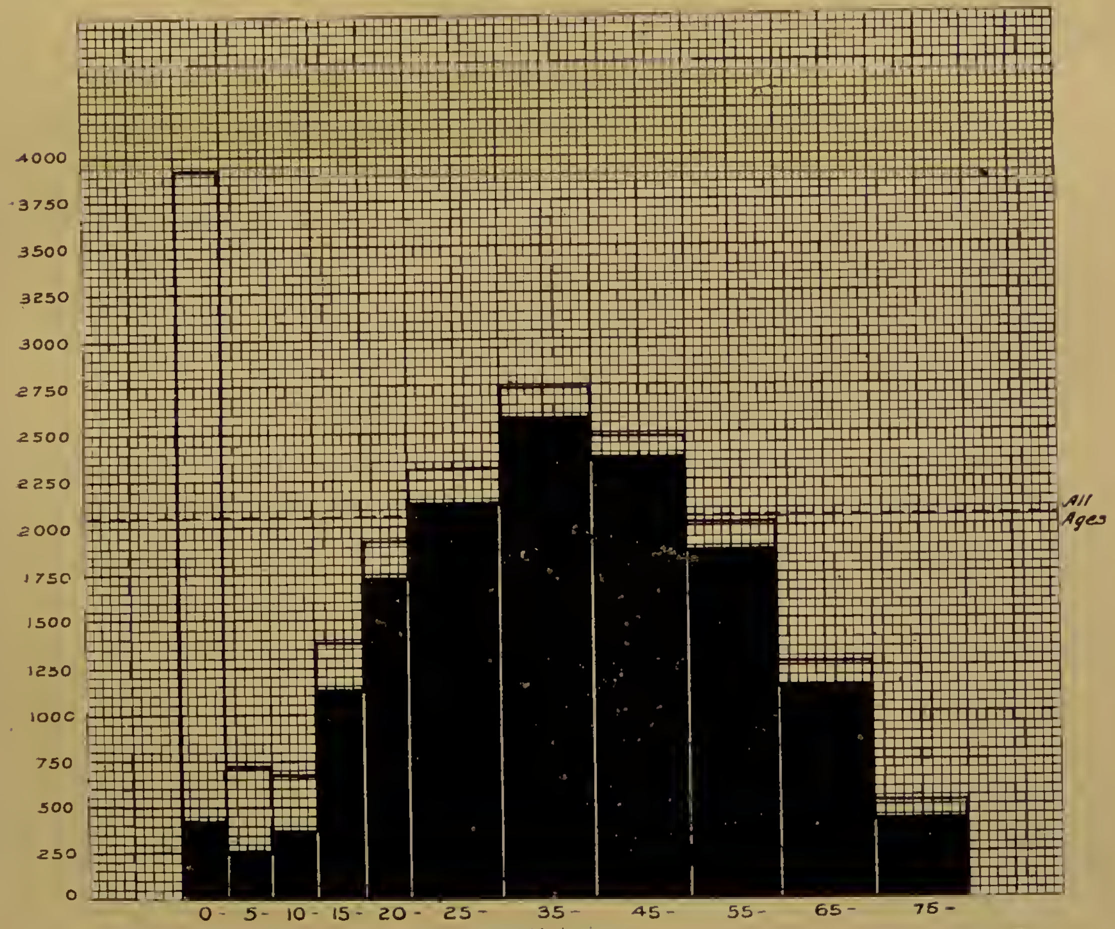
DIAGRAM I.

ANNUAL MORTALITY FROM TUBERCULOSIS, PER MILLION LIVING AT ALL AGES AND AT ELEVEN GROUPS OF AGES IN THE DECENNIUM 1891-1900

ENGLAND & WALES



Tuberculous Diseases other than Phthisis



Phthisis

S. Delépine Oct 1911

between the relative importance of the two groups of tuberculous lesions before the age of five and after the age of fifteen was still more marked.

Before the age of five the average yearly mortality was 3930 per million, the deaths from phthisis were at the rate of 413, while those from tuberculosis other than phthisis were at the rate of 3517.

That is to say, that for every 100 deaths from phthisis there were about 850 deaths from tuberculosis other than phthisis before the age of five.

In later periods of life it was between the ages of thirty-five to forty-five that the average yearly mortality from all forms of tuberculosis was greatest, being 2742 per million. Of these deaths 2592 were attributed to phthisis and 150 to tuberculosis other than phthisis.

That is to say, that for every 100 deaths from phthisis there were only five to six deaths from other forms of tuberculosis.

These facts may be summed up as follows:

Ratios between Death-rates from Phthisis and from Tuberculosis other than Phthisis per Million Persons Living at Two Groups of Age.

Group.	Phthisis.	Tuberculosis other than phthisis.
0 to 5 years	100	850
35 to 45 years	100	less than 6

These ratios can be explained in two ways:

(1) It may be supposed that a great number of children are infected before the age of five, that those who die before five succumb before the lungs are seriously affected, and that those who recover from the first effects of infection may either recover permanently, or die from extension of the disease to the lungs when they have passed the age of five.

(2) Or the difference may be accounted for by reference to the probable channels of infection, infection through the alimentary canal being predominant in infancy, infection through the air-passages becoming more and more common after the age-

period of ten to fifteen. The infants' food most liable to massive tuberculous infection being cow's milk, bovine tuberculosis would, according to the last hypothesis, be one of the most important factors determining the preponderance of tuberculosis other than phthisis before the age of five.

On the basis of considerations of this kind and of various pathological observations and experiments, I came to the conclusion in 1891 that the second hypothesis gave a better explanation of facts than the first, and the experience I have gained since then has confirmed me in that opinion.

It was in 1896 that the Public Health Committees of Liverpool and Manchester began to consider the possibility of controlling administratively the milk supply of these towns for the purpose of protecting infants against the danger of infection by tuberculous cow's milk.

I have already stated that as a result of the work done in Manchester during the last fourteen years the amount of tuberculous milk supplied to the town has been reduced to about one third of what it was originally, and its infectivity has also been reduced to a very considerable degree.

Dr. Niven and the veterinary surgeons who have assisted him in the administration of the Manchester Milk Clauses deserve great credit for the admirable way in which the administrative part of this work has been carried out, often under great difficulties. If my belief in the dangers associated with tuberculous cow's milk is correct, the improvement in the Manchester milk supply must have produced a distinct diminution in the number of children affected with tuberculosis other than phthisis.

(4) *Statistical evidence*: B. *Inquiry into the apparent effects of the control of the milk supply upon the mortality from tuberculosis during the twenty years* 1891–1900.—Preliminary observations were made during the years 1896, 1897 and 1898, which may serve as a basis for an estimate of the degree of tuberculous infection of the milk supply of Manchester before 1899.

Since 1899 the supply has been under active control, with the results recorded in the following table:

Table II.—*Manchester Mixed Milk collected at Railway Stations, or Places other than the Farms*, 1897–1910. *Number of Samples Examined, Number found Tuberculous, and Percentage.*

Before control.	Total number of samples examined.	Number tuberculous.	Percentage.
1897–1899	110	19	17·2
Beginning of control			
1900	358	40	11·1
1901	440	43	9·7
1902	424	38	8·9
1903	430	51	11·8
1904	425	43	10·1
1905	757	60	7·9
1906	704	47	6·6
1907	722	43	5·9
1908 (including a few farm samples)	341	30	8·7
1909	649	36	5 5
1910	528	32	6·0
	5888	502	8·5

From this table it will be seen that since 1899 the proportion of tuberculous milk supplied to Manchester consumers has been reduced from 17·2 per cent. to from 5·5 to 6·0 per cent.

While this improvement in the food supply was taking place Dr. Niven was also actively engaged in combatting other sources of tuberculous infection more especially in relation to phthisis.

In attempting to estimate the effects which the improvement in the milk supply may have had upon the mortality from tuberculosis, it is necessary to allow for any improvement which may have been due to sanitary measures *not directed against tuberculous milk.*

It is not possible to do this with absolute accuracy, but it is obvious that any improvement in the general death-rate may be taken to indicate roughly the effects of general improvements in the hygenic state of the town, including improvement in the milk supply. It may also be surmised that the steps taken to reduce the chances of infection from person to person must produce in the mortality from the two types of tuberculosis which are under consideration effects differing from those resulting from measures directed against food infection only.

One may therefore argue that if the improvement which has taken place in the mortality from tuberculosis, other than phthisis, is no greater than that observed with regard to phthisis, or to all other causes of death, nothing can be safely claimed as a result of the improvement in the milk supply.

On the other hand, *if the reduction in the mortality from tuberculous diseases other than phthisis is proportionally greater than the reduction in the mortality from phthisis, and from all causes,* it is reasonable to claim that this result is in all probability due to improvement in the milk, and the amount of that improvement may be taken as a basis for a low estimate of the share taken by bovine tuberculosis in the infection of human beings.

The position of Manchester with regard to mortality from all causes, and from tuberculosis in particular, was very bad twenty years ago, and notwithstanding the great improvement which has taken place during that period, Manchester has still much to do in order to reach the high level attained by certain towns.

In order to appreciate the effects of sanitation, it is necessary to take account of the initial state and to *estimate by the* rate *of improvement the effects of the work done.* This is the method which I have adopted.

The following tables, which I have prepared from the data given in Dr. Niven's annual reports, supplemented by fuller information which he has kindly supplied me with, show what the position of Manchester has been between the years 1891 and 1910 with regard to the mortality from all causes, from phthisis, and from tuberculous diseases other than phthisis, in three groups of persons:

(A) Persons at all ages.
(B) Children under five years of age.
(C) Children under one year of age.

In each case I have taken the death-rate for the last quinquennium as a term of comparison to find what relation there is between that unit and the rates for the previous years or quinquennia. This is what I call the ratio to the 1906–1910 rate. From this ratio it is possible to ascertain how many persons died in 1890 for each person, or 100 persons, dying from a certain cause during each of the last five years on an average. In Table III, for instance, we find that the number of deaths from all causes corresponding to 100 in 1906–1910 was 136 in 1886–1890. By this method it is easy to obtain comparable figures, and to estimate the progress effected during a certain period with regard to various causes of death.

(In order to show as far as possible the state of things previous to the period selected, I have added to the figures supplied by Dr. Niven those relating to the quinquennia 1881–90, as given in the supplement to the Sixty-fifth Annual Report of the Registrar-General.)

TABLE III.—*Manchester. Annual Rates of Mortality from Tuberculosis per 1000 persons living at all ages.*

Quinquennia.	All causes.		Phthisis.		Forms of tuberculosis other than phthisis.	
	Rate.	Ratio to 1906-1910 rate.	Rate.	Ratio to 1906-1910 rate.	Rate.	Ratio to 1906-1910 rate.
1881–1885	23·6	*1·33*	2·42	*1·46*	0·92	*1·56*
1886–1890	24·6	*1·36*	2·24	*1·36*	0·95	*1·61*
1891–1895	23·6	*1·33*	2·09	*1·26*	0·97	*1·64*
1896–1900	22·7	*1·28*	2·04	*1·23*	0·82	*1·39*
1901–1905	20·1	*1·13*	1·94	*1·17*	0·71	*1·20*
1906–1910	17·7	*1·00*	1·65	*1·00*	0·59	*1·00*

These figures are not all based on the same population, owing to changes in the administrative area. The mean estimated population for 1881–85 was 542,746; 1886–90, 575,630; 1891–95, 517,801; 1896–1900, 539,599; 1901–05, 554,355; 1906–10, 660,049. The rates recorded are not therefore absolutely comparable, but the errors caused by this are not important enough to vitiate the general indications given by the figures.

TABLE IV.—*City of Manchester Death-rates per* 1000 *of the Population under* 5 *years and ratios to* 1906–10 *rate.*

Quinquennia.	Year.	All causes.		Phthisis.		Forms of tuberculosis other than phthisis.	
		Rate.	Ratio to 1906-1910 rate.	Rate.	Ratio to 1906-1910 rate.	Rate.	Ratio to 1906-1910 rate.
1881–1885 1886–*1890*	—	92·84	*1·63*	0·40	*1·02*	6·39	*1·98*
	1891	86·6	1·52	0·55	1·41	6·77	2·10
	1892	78·7	1·38	0·17	0·43	5·94	1·87
	1893	86·3	1·51	0·38	0·97	6·55	2·03
	1894	66·5	1·17	0·22	0·56	6·37	1·97
	1895	90·7	1·59	0·48	1·23	6·29	1·95
1891–1895	—	81·7	*1·43*	0·36	*0·92*	6·38	*1·98*
	1896	80·4	1·41	0·51	1·30	4·75	1·50
	1897	85·3	1·50	0·56	1·43	5·81	1·80
	1898	78·1	1·37	0·37	0·94	5·52	1·71
	1899	87·5	1·54	0·48	1·23	5·22	1·62
	1900	78·3	1·37	0·28	0·71	4·67	1·45
1896–1900	—	81·9	*1·44*	0·44	*1·12*	5·19	*1·61*
	1901	74·5	1·31	0·28	0·71	4·56	1·41
	1902	64·7	1·13	0·29	0·74	4·17	1·29
	1903	69·5	1·22	0·34	0·87	4·58	1·42
	1904	75·8	1·33	0·40	1·02	3·86	1·20
	1905	59·2	1·04	0·36	0·92	3·37	1·04
1901–1905	—	68·7	*1·20*	0·33	*0·84*	4·10	*1·27*
	1906	66·6	1·17	0·32	0·82	3·69	1·14
	1907	56·6	0·98	0·34	0·87	3·19	0·98
	1908	60·0	1·05	0·42	1·07	3·38	1·04
	1909	52·1	0·91	0·44	1·12	3·16	0·98
	1910	49·2	0·86	0·35	0·89	2·74	0·85
1906–1910	—	56·8	*1·00*	0·39	*1·00*	3·22	*1·00*

TABLE V.—*City of Manchester. Deaths of Children under 1 Year per* 1000 *Births and ratios to* 1906–10 *rate.*

Quinquennia.	Year.	All causes.		Phthisis.		Forms of tuberculosis other than phthisis.	
		Rate.	Ratio to 1906–1910 rate.	Rate.	Ratio to 1906–1910 rate.	Rate.	Ratio to 1906–1910 rate.
1881–1885 1886–*1890*	—	193	*1·30*	*0·37*	*1·19*	12·8	*2·48*
	1891	191·71	1·30	0·23	0·74	11·04	2·12
	1892	178·24	1·21	0·06	0·19	10·08	1·94
	1893	201·39	1·36	0·41	1·32	11·75	2·26
	1894	158·54	1·07	0·18	0·58	10·84	2·08
	1895	202·43	1·37	0·45	1·45	11·58	2·23
1891–1895	—	186·46	*1·26*	0·28	*0·90*	11·05	*2·12*
	1896	176·13	1·19	0·40	1·29	8·54	1·64
	1897	194·62	1·32	0·91	2·93	10·26	1·97
	1898	195·87	1·32	0·51	1·64	9·04	1·74
	1899	205·42	1·39	0·40	1·22	9·68	1·86
	1900	188·74	1·28	0·11	0·35	8·31	1·60
1896-1900	—	192·16	*1·30*	0·46	*1·48*	9·16	*1·76*
	1901	198·46	1·34	0·25	0·80	8·67	1·67
	1902	151·44	1·02	0·17	0·54	7·22	1·39
	1903	168·54	1·14	0·17	0·54	8·14	1·58
	1904	186·71	1·26	0·40	1·29	6·63	1·27
	1905	158·74	1·07	0·27	0·87	6·44	1·24
1901–1905	—	172·78	*1·17*	0·25	*0·80*	7·42	*1·42*
	1906	169·10	1·14	0·22	0·70	5·71	1·10
	1907	147·44	1·00	0·11	0·35	5·31	1·02
	1908	152·46	1·03	0·42	1·35	5·31	1·02
	1909	135·55	0·92	0·33	1·06	5·33	1·02
	1910	131·84	0·89	0·47	1·51	4·22	0·81
1906–1910	—	147·28	*1·00*	0·31	*1·00*	5·19	*1·00*

These tables show that as regards the mortality per 1000 persons at all ages there was a rise up to 1891–95, after which there was a steady fall. The improvement since 1891 is indicated by the following ratios:

$\frac{1891\text{–}95}{1906\text{–}10}$ *Mortality Ratios for Persons at all Ages.*

All causes	1·33
Phthisis	1·26
Tuberculosis other than phthisis	1·64

With regard to phthisis there was already a marked fall before 1891–95. The improvement which has taken place since 1891–95 is indicated by the ratio 1·26. There was a rise in the mortality from tuberculous diseases other than phthisis before 1891–95, followed since that date by a rapid diminution, indicated by the ratio 1·64. The reduction in the mortality from that cause which affects children specially has, therefore, been much more rapid than that observed in connection with all causes of death and with phthisis respectively. The ratios relating to mortality among children under five years of age point in the same direction:

$\frac{1891\text{–}95}{1906\text{–}10}$ *Mortality Ratios for Children under Five Years.*

Ratio for all causes	1·43
For phthisis	0·92
For tuberculous diseases other than phthisis	1·98

The number of deaths from phthisis at that age is so small that the statistics have little value, but the ratios indicate very clearly the importance of food as a causal factor.

It is, however, when the ratios relating to infantile mortality are studied that one perceives the great improvement which has resulted from the reduction in the amount of tuberculous milk:

$\frac{1891\text{–}95}{1906\text{–}10}$ *Ratio for Infants under One Year.*

All causes	1·26
Phthisis	0·90
Tuberculous diseases other than phthisis	2·12

It might, however, be supposed that the reduction in mortality from tuberculous diseases observed in Manchester is the result of some improvement which has taken place all through the country owing to the better education of mothers, better sanitation and social conditions and various other possible causes.

In order to ascertain whether this was the case I have prepared from the returns published by the Registrar-General tables relating to England and Wales, corresponding to the Manchester tables. By means of these tables it is easy with regard to mortality at all ages to compare the $\frac{1891–95}{1906–10}$ ratios for the whole of England and Wales with those for Manchester (see Table VI). But with regard to mortality of children under five and under one year of age I have been obliged to use the decennial rates for the whole of England and Wales, and have therefore indicated the ratios based on decennial rates for Manchester also. I have adopted this course because I preferred using figures published by the best statistical authority.

Table VI.—*Reduction in Mortality during the 20 years* 1891–1910.

	Ratio. $\frac{1891–95}{1906–10}$		
Mortality at all ages :	England and Wales.	Manchester.	
From all causes	1·25	1·33	
From phthisis	1·30	1·26	
From tuberculous diseases other than phthisis	1·41	1·64	
Mortality under 5 years :	Ratio. $\frac{1891–1900.}{1900–1910.}$		Ratio. $\frac{1891–1900.}{1900–1910.}$
From all causes	(1·41)	1·43	(1·43)
From tuberculous diseases other than phthisis	(1·53)	1·98	(1·78)
Mortality under 1 year :			
From all causes	(1·28)	1·26	(1·28)
From tuberculous diseases other than phthisis	(1·75)	2·12	(1·94)

From the ratios given in the last table an approximate estimate can be made of the reduction in the mortality from all causes, from phthisis and from tuberculosis other than phthisis that has taken place in Manchester during the last twenty years.

Thus we find that *had the average rate of mortality observed in* 1891–95 *remained unaltered*—

(*a*) the mortality *at all ages* observed in 1906–10 from all causes would have been 133 instead of 100, or a gain of 33; from phthisis 126, or a gain of 26; from other tuberculous diseases 164, or a gain of 64.

(*b*) The mortality of *children under five years* from all causes would have been 143 instead of 100, or a gain of 43; from phthisis, no improvement; from tuberculosis other than phthisis, 198, or a gain of 98.

(*c*) The mortality of *children under one year* from all causes would have been 126 instead of 100, or a gain of 26; from phthisis, no improvement: from tuberculosis other than phthisis, 212, or a gain of 112.

The statistics relating to various age-groups indicate, therefore, a very much greater improvement with regard to tuberculosis other than phthisis than in connection with phthisis or all causes of disease. It is to be noticed, however, that an improvement of the same kind, but not of the same magnitude, is indicated by the statistics relating to the whole of England and Wales.

This is attributable partly to improved sanitation generally and partly to the greater attention which has been paid all through the country to the dangers associated with the use of tuberculous milk, but nowhere in England and Wales have such stringent measures been taken against tuberculous infection of cow's milk at its source as in Manchester. The differences between the ratios for the whole of England and Wales and those for Manchester may, therefore, be taken to indicate almost certainly one of the effects which may reasonably be attributed to the improvement in the milk supply. The differences between the ratios relating to *tuberculosis other than phthisis* are as follows:

	England and Wales.	Manchester.	Gain for Manchester.
All ages	141	164	23
Under 5 years	153	178	25
Under 1 year	175	194	19

The last two sets of figures indicate decennial differences, and do not, therefore, indicate fully the progress which has been made in Manchester, because at the beginning of the decennium 1900–1910 the work of purification had only just begun. Although it is not quite correct to compare the last decennial figures for England and Wales with the last quinquennial figures for Manchester, I believe that a more accurate idea of the improvement obtained in Manchester can be obtained by this device. The improvement would then be indicated by the following figures:

Under 5 *years.*—England and Wales, 153; Manchester, 198; gain 45.

Under 1 *year.*—England and Wales, 175; Manchester, 212; gain, 37.

This indicates a reduction for Manchester of about 22 per cent. in excess of that which on an average has taken place in the whole of England and Wales in the number of deaths from tuberculosis of children under five years of age.

Part of the reduction which has taken place all through the country is very probably due to a general improvement in the milk supply, but I have found no means of estimating the share taken by this factor in the reduction of the mortality.

I have constructed Diagram II, so as to bring out graphically the main facts indicated by the statistical data discussed in the last section of this communication.

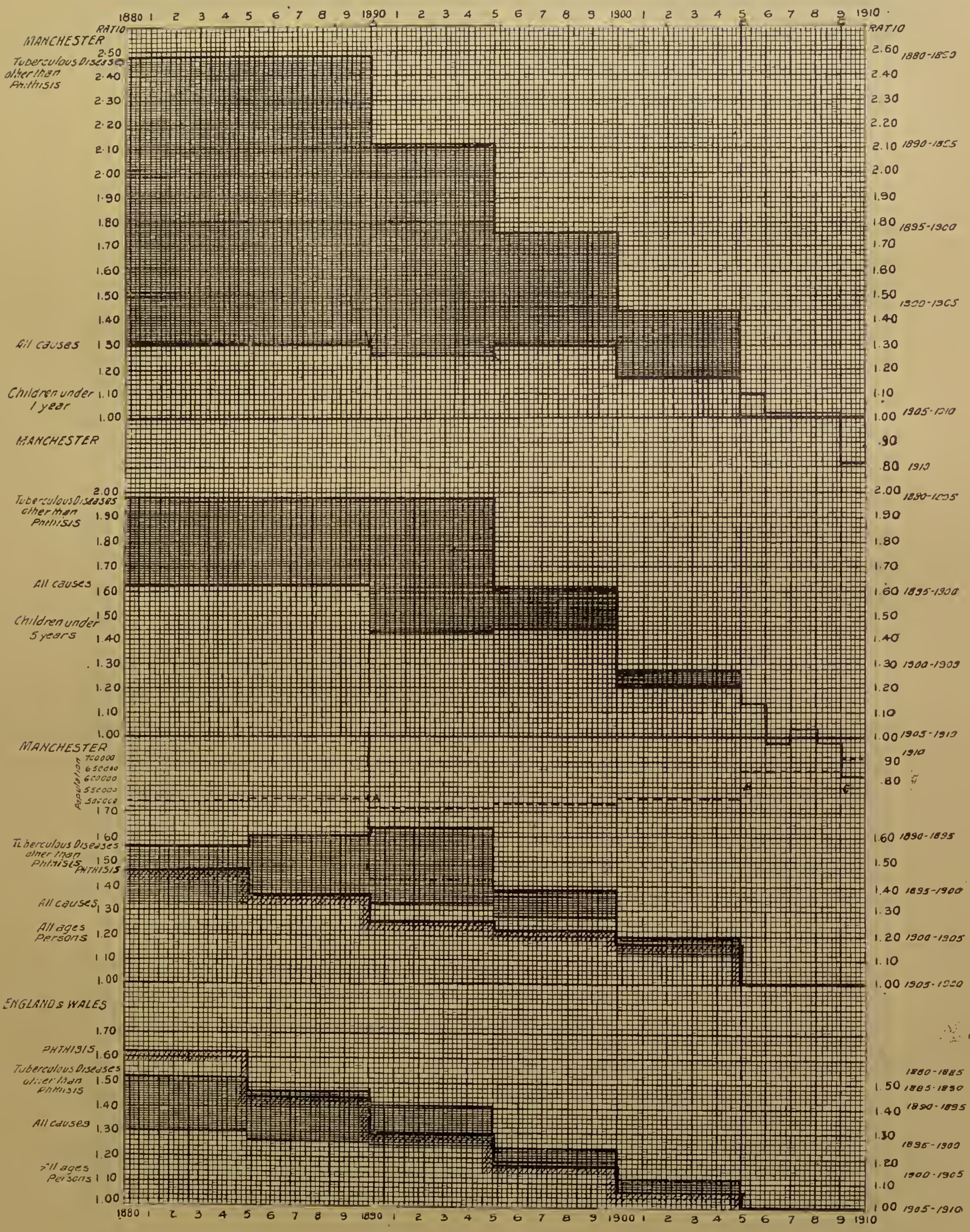
Before concluding I must again insist upon the fact that the infantile mortality from tuberculosis does not indicate all the cases of infection that occur during the period selected, because many of the infected children do not die before their fifth year; it is also important to remember that among the children whose deaths are recorded as due to other diseases than tuberculosis, there are many who are also suffering from tuberculous infection.

Taking all these things into consideration I think that it is

DIAGRAM. II.

IMPROVEMENT WHICH HAS TAKEN PLACE IN MANCHESTER between 1880 & 1910 in the MORTALITY from TUBERCULOSIS at VARIOUS AGES

THE PARTS SHADED WITH BLACK LINES SHOW HOW MUCH GREATER THAN AT PRESENT THE MORTALITY WAS DURING THE PREVIOUS 30 YEARS



Sheridan Delépine

possible to say, without fear of exaggeration, that *not less than 25 per cent. of the tuberculous children under five years of age suffer from infection of bovine origin,* and that *this estimate is much lower than one based on probabilities would be.*

DISCUSSION.

Professor G. Sims Woodhead, M.D.: Mr. Chairman, Ladies and Gentlemen,—I realise that after Professor Delépine has given us of the wealth of his experience some of his observations on the share taken respectively by human and bovine tuberculosis in the infection of young children, it will be difficult for any of us to add very much to the weight of his pronouncement. I should like, however, to place before you in this discussion my conviction that wherever a full and thorough investigation of the question has been carried out, the opinion has gained ground that a considerable number of the cases of tuberculous infection of young children is of bovine origin. At the same time I should like to state that I have been much impressed by the fact that very competent investigators have failed, though they have examined large numbers of cases of tuberculosis in children, to obtain evidence of such infection in anything like the same proportion of cases as have we in our examination of the cases of tuberculosis in certain areas of our own country. It is a very interesting fact, for example, that almost all who have carried out investigations on tuberculosis amongst children in Edinburgh have recorded a large proportion of cases that seem to be the result of infection from bovine sources, whilst Koch, who, at first at any rate, examined a comparatively small number of cases and had not the same means of differentiation that at present are at our disposal—facts that must be taken into account—was unable to satisfy himself of the bovine origin of any of these cases of tuberculosis in the human subject, child or adult.

At the present day, and with other workers in the same areas, there still remain the same considerable divergences of opinion. So far as I can learn all the results obtained in the Edinburgh laboratories appear to confirm my own early observations made in

Edinburgh, and my opinion based thereon. This opinion appears perhaps to have been a little in advance of the findings of the Royal Commission, and, of course, for the present, bearing in mind the detailed information provided by the Royal Commission I feel justified in accepting its findings on the question, so far, at any rate, as Great Britain is concerned. When, however, we come to examine German experiments and statistics made and collected by most competent observers, it is evident that bovine tuberculosis may not play such an important part in spreading tuberculosis amongst children in Germany as it does in this country, though I am by no means satisfied that it plays such a small part as one would gather from published statistics. Indeed, when we consider that the methods used in Germany differ somewhat markedly from those used in this country, one hesitates to institute too close a comparison between the different results and sets of statistics. Before this can be done I maintain a comparative investigation must be carried on in different parts of our own country and of Germany in which the methods of both the British and German commissions should be tested, several groups of workers carrying on their investigations in different districts. Up to the present we have relied purely upon the appearances and rate of growth of cultures on *solid* media + virulence for rabbits and calves for our diagnosis, and we believe that we are more certain to obtain regular and reliable results where the growth can be observed on a solid surface, determine the method of its spread, early proliferative activity, and later luxuriance of growth, without disturbing this growth in any way, than when fluid culture media are used.

Broth cultures appear to be much more difficult of control, whilst the conditions and methods of growth are certainly more difficult to observe. Personally, I cannot but think that over a large series of cultivation experiments it is quite possible that some of the more dysgonic organisms have found the conditions of growth in broth so much against them that they have never been able to make a start. I have certainly been able to obtain growths on egg medium when I have absolutely failed to obtain any appreciable growth in broth. Although these are points on which I should not like to speak too dogmatically, I feel that until we have had them thoroughly investigated on the bacilli obtained from different districts, the question of the proportion of bovine and human bacilli infecting children cannot be considered to be settled, and I hope that in the near future there may be some opportunity presented to those interested in the subject of carrying out thorough investigation on the lines indicated by the above.

Our German colleagues investigating these questions are working most patiently and conscientiously. Many of their results are in line with our own, though on others we have arrived at different conclusions. The more thorough the investigation, however, the closer come to be our standpoints.

The question here raised is of enormous importance, and I do not apologise for bringing it before you. A few days ago there came under my notice an article in *Science Progress,* in which a medical man makes a series of very strong assertions, and criticises very severely the findings of the Commission, on what solid grounds I cannot gather from his article, but I would put it to all who take an interest in the health and welfare of our children that until it can be definitely proved that the bovine bacillus plays no part in the production of tuberculosis in the human subject, and as long as we have the slightest evidence that it does play such a part, we are in duty bound to accept the proposition that an organism so virulent as the bovine tubercle bacillus for so many groups of animals, so frequently met with in the child, and so often associated with virulent tuberculosis in the child, cannot be ignored in any preventive measures that we take, or in any scheme devised for the stamping out of tuberculosis.

Dr. NATHAN RAW (Liverpool) : There is no more important factor in the great problem of tuberculosis than the infection of young children, and the fact of supreme importance in the study of this great question is the possibility of infection from both animals and man.

Children are peculiarly susceptible to infection by tubercle, both from the delicacy of their constitutions and their feeble power of resistance to the bacillus of tuberculosis.

The infection from man, or what is called human infection, is always conveyed by the expectoration or by kissing, and the presence of any person in the household suffering from open tuberculosis may be a serious danger to young children, unless careful precautions are taken to disinfect the sputum.

If this is done there is practically no danger whatever.

The kissing of children by consumptives should be strictly forbidden by the doctor, as in this way the disease is unwittingly conveyed from parents to children. Hereditary transmission of consumption from parents to children may for all practical purposes be ignored, as we know that it rarely occurs; but the children of consumptive parents, being generally of a delicate and frail constitution, are more susceptible to pick up infection and have little power to resist it: hence the frequency of consumption amongst members of the same family.

It is possible also for the germs of tuberculosis to enter the body in early childhood, and to remain dormant for many years before they develop active disease.

Consumption is uncommon in children under twelve years of age, for if we examine some thousands of school-children very few cases are discovered, but when they are found they should be at once removed from the school, otherwise both teachers and scholars run a grave risk of infection.

For this reason it is necessary that all schools should be very well ventilated, and great care exercised by the authorities to avoid overcrowding of classes. Another question of supreme importance is the danger of infection from tuberculous milk.

It is a lamentable fact that about 20 or 25 per cent. of dairy cows in this country are at present suffering from tuberculosis.

Fortunately only about 2 per cent. are affected in the udder, which renders the milk dangerous, but the milk of one udder-diseased cow, if mixed with the milk of twenty or thirty healthy cows, will contaminate the whole supply, and thus cause the milk to be highly dangerous to infants and young children.

The symptoms caused by bovine tuberculosis are quite different to those caused by human tuberculosis.

Enlarged glands in the neck, abdominal tuberculosis, strumous joints, hip disease, spinal disease, lupus and meningitis are caused by infection from cattle through diseased milk, causing an enormous loss of life, much crippling and great suffering, and I feel certain that when the tubercle germs are removed or destroyed in milk these dread diseases will entirely disappear from children.

Consumption in children is always the result of infection from a previous case of consumption and has nothing whatever to do with the milk supply, so that if all tuberculous cows were removed to-morrow we would still have consumption to deal with, and which is, after all, the greatest part of the problem.

Dairy cattle are now being vigorously inspected, and I have observed in my hospital practice in Liverpool a great diminution in these forms of tuberculosis which I have mentioned as being caused by milk, amounting to about 35 per cent. during the last ten years. This is most gratifying, and there is no reason why this great improvement should not continue, although I admit the expense of eradicating tuberculous cows is enormous.

It would be wise economy to spend £2,000,000 in destroying all udder-diseased cows, and to have as a certain result the total disappearance of these forms of tuberculosis amongst little children. In the meantime, and until this happy time arrives, my advice to all mothers is—"Boil the milk."

Dr. Marsden, M.O.H., Birkenhead, thought that research had been too exclusively directed towards animals which were susceptible to tuberculosis like the guinea-pig. There was need for research into the nature of the germicidal powers which enabled the goat and other animals to resist tuberculosis. Such a research might be extended to throw light on the conditions of resistance in human beings.

Dr. Hibbert, M.O.H., Warrington, thought the danger of tuberculous milk could not be estimated from the statistics of large cities such as Manchester and Liverpool, which had done so much in the last sixteen years to improve their conditions. He might quote the experience of his own town, Warrington, where an investigation by the Corporation two years ago showed over 20 per cent. of the milk supply to be tuberculous. In fact he calculated that in 1911 more than two thousand pints of tuberculous milk were distributed daily. Other of the smaller towns would find on investigation a similar condition. Thanks to efforts made the percentage had been reduced since then from 20 to 6 per cent.

Mr. Councillor **Hailwood** (Salford) would like to put one or two questions to Professor Delépine, the answers to which might show how the proportion of tuberculous milk might be still further reduced. First he should like to know whether it was possible to judge tuberculous milk by the microscope, and again, whether it would not be better for all samples of milk taken to be divided into two portions, one for the analytical department, and another for the bacteriological department, as is done in Philadelphia, a city with a million and a half population, where they had practically stamped out tuberculous milk, and where they awarded the farmer whose cows are found to be tuberculous a compensation of £14 per cow. Another question was with regard to the taking of samples in Manchester. Samples were taken from tuberculous milk in Manchester and again in Salford, with the result that very likely the same milk was sampled a second time, causing overlapping which ought not to exist. If they had a central authority for Manchester and Salford, paid for by each according to population, it would be far better. All the samples could be worked out in a central laboratory and they would thus get a quicker return of tuberculous milk. When he was in the City Hall in Philadelphia he was told they could examine milk in a few hours, and if the milk were proved to be bad by the microscope, the supply could be stopped at once. That was a step in the right direction. Then again in Manchester they had milk not only from Cheshire—the bulk of it was from there, but also from Shropshire, Yorkshire, Lancashire, Cumberland and Westmoreland. When Dr. Niven made his report he should say that so many samples of tuberculous milk—giving the percentage—came from Cheshire, and he should compare these figures with those relating to Shropshire, Lancashire and the other counties. This would induce a kind of competition between the counties to send pure, healthy milk, and the best record would induce people to purchase the milk sent by that county.

Mr. **Morgan Hopkin** (Swansea), speaking as representing working men and as a working man himself, thought there was only one cure for this scourge of consumption, and one means of prevention. England should follow the example set by Denmark. What was the use of discussing the question of curing consumption when the poor child was compelled to take tuberculous milk? That milk was brought from rural districts where towns like Swansea, or Manchester and Liverpool, had no power to control or visit. What was wanted was concerted action and Government aid. The Government of this country had practically eradicated pleuro-pneumonia; and this had been done by the simple method of requiring the farmer who had an animal suffering from the disease to notify the veterinary inspector, and the farmer was compensated for the animal's destruction. Why could not the same thing be done with regard to tuberculous cases? In Swansea 90 per cent. of the milk was brought from outside the borough, and they could not send their veterinary inspector to examine the cow-sheds. Moreover, the members of rural councils and county councils were generally farmers and they resented interference. Therefore they must have an authority above the county council, and they must appeal to Parliament for it. He hoped the Conference would not separate without some action being taken in the direction he indicated.

The CHAIRMAN: May I explain to Mr. Hopkin that both Manchester and Liverpool have absolute power to go into any district and deal with any tuberculous cow which may be found provided the milk comes into the city.

Mr. MORGAN HOPKIN: That is not so in Swansea.

The CHAIRMAN: Then Swansea must at once apply to Parliament for the same powers that Manchester has, and Parliament will give them open-handed.

Mr. ERNEST JONES, Chairman of Sale Urban District Council, said there was no article of food which was more liable to contamination, or a more perfect medium for the propagation of death-dealing germs than milk. Such being the case, the importance of a pure milk supply could not be over-estimated. It was a notorious fact—and he had verified it himself by personal observation and inquiry—that a very large portion of the milk supplied, more especially to poor consumers, in many of their large cities was in a very unsatisfactory state as regards quality, and seriously contaminated by bacteria. What were the causes of this state of affairs throughout the country? They might look firstly to the insanitary condition and want of cleanliness in the large farms; secondly, to the more or less diseased animals on these farms; and thirdly, to the want of care exercised by farmers and railway companies in the handling of milk, and also to the more or less fraudulent manipulation of the same by dealers, wholesale and retail. The result was that milk often reached the consumer's hands in a state which quite justified Professor Hope's phrase when he spoke of it as "putrescent." And with all this it was a very common practice for vendors to preserve their milk. They called it "preservation," but the process was rather that of preserving in a state of quiescence for the time deadly germs which would develop later. As preservatives boracic acid and formalin were largely used, and they should be strictly forbidden, especially as the "preservation" enabled unscrupulous dealers to dispose of milk otherwise perfectly unsaleable.

If local authorities would put into force the powers which they possessed under the Dairies, Cowsheds, and Milkshops Order of 1885, assisted as they were by the Regulations of the Local Government Board, much could be done to prevent many of the grosser evils; but as most of the provisions of that order were simply optional and not compulsory, they were a dead letter with most of these authorities. When they considered that five or six per cent. of all the children born in their great towns died before the first anniversary of their birth, largely owing, or probably owing, to disease of the alimentary organs, clearly traceable in many instances to corrupt milk, he might reasonably ask this Conference to give some serious consideration to the points which he had endeavoured to emphasise.

AFTERNOON SESSION, JUNE 5th.

Dr. W. Leslie Mackenzie, F.R.S.E., medical member, Local Government Board for Scotland, presided.

TUBERCULOSIS DURING SCHOOL LIFE: ITS PREVALENCE; THE MEANS OF DETECTION.

By JOHN PRIESTLEY,
Senior School Medical Inspector, Staffs. C.C. Education Committee.

Prevalence.

The prevalence of tuberculosis among children of school age (roughly 5–15) may be illustrated by three lines of research, and the problem is to reconcile the divergent results—or apparently divergent results—in a simple and comprehensive formula.

The three lines of research are, of course, (1) the enumeration of observed cases in groups of school-children; (2) post-mortem observations; and (3) the observations of tuberculin reactions. Let us take these in order.

(1) The cases of tuberculosis noted during three successive years among Staffordshire school-children examined in school are given in the following table, the cases of pulmonary tuberculosis being given in a separate column.

Staffordshire Schools, 1909–10–11.

Children.	No. examined.	Tuberculosis. All cases. Per cent.	Tuberculosis. Pulmonary. Per cent.
5–6	25,274	105 (0·41)	23 (0·09)
8–9	23,537	132 (0·56)	39 (0·16)
12–14	13,425	81 (0·60)	18 (0·13)
Boys	31,352	151 (0·48)	32 (0·10)
Girls	30,884	167 (0·54)	48 (0·15)
Totals	62,236	318 (0·51)	80 (0·13)

I may say that the children are different in each of the three age-groups; there is no overlapping.

No one will deny that these percentage figures are in themselves small, and some, perhaps, will consider them hopelessly inadequate. But two things must be remembered when considering their smallness: (*a*) The figures are those of country schools; we have few poverty-stricken neighbourhoods in our area; (*b*) the figures refer to children *in school*, and not to the totality of children of school age. Of this totality, some never come on the school rolls at all, and of those that do 10 per cent. are constantly absent from school. The causes of absence are many and various; but it is quite clear that the proportion of ailing children in the 10 per cent. stratum of absentees will be much greater than in the 90 per cent. in school.

It will be noticed that the figures illustrate the fact, which many others have remarked, that girls of school age suffer more often from tuberculosis than boys.

An increase of the prevalence of tuberculosis as the children are older is also shown.

I should like to have compared these figures with the results of post-mortem observations, and the results of tuberculin tests, in the school-children of our own area, or in children in similar circumstances; but no such figures exist. I must, therefore, for the moment leave the Staffordshire children and consider the case of town children.

What are the equivalent figures for town children? The following table gives the answer.*

Observers.	No. examined.	Tuberculosis. All cases. Per cent.	Tuberculosis. Pulmonary. Per cent.
Manchester.			
S.M.O. 1910	13,751	68 (0·49)	45 (0·33)
Liverpool.			
S.M.O. 1910	22,819	77 (0·34)	55 (0·24)

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* Nos. 1 and 2 are quoted by the Chief Medical Officer to the Board of Education in his Annual Report on 1910, p. 73. Nos. 3 and 4 are given in 'Trans. Second Internat. Cong. on School Hygiene, London, 1907,' vol. ii, p. 671, and p. 673. Basing on over 500,000 children, town and country, in England and Wales, the Chief Medical Officer finds 0·67 per cent. of tuberculosis of all kinds and 0·28 per cent. phthisis.

Observers.	No. examined.	Tuberculosis. All cases. Per cent.	Tuberculosis. Pulmonary. Per cent.
London. Squire and Gowdie	1,670	(?)	8 (0·47)
Brighton. Lecky and Horton	806	(?)	3 (0·37)

Comparing these figures with the country figures of Staffordshire, it will be noticed that while the percentages for all tubercular cases are not unlike, the percentage number of pulmonary cases is considerably greater in the towns.

Some of these figures are derived from the ordinary routine school medical inspections, where the clinical methods are rapid and have no pretentions to great refinement. Others (Squire and Gowdie and Lecky and Horton) are derived from the careful, intensive examination of smaller groups of children. It is interesting and of great importance to notice that the results of the two methods are very similar.

(2) I turn now to the statistics of post-mortems, and here it will not be necessary to trouble you with a table. The figures are well known. Something like 30 per cent., more or less, of children who die at school age die of tuberculosis, and another 10 per cent., who do not actually die of tuberculosis, yet show evidences of its ravages.

Some sets of figures show an even greater proportion of tuberculous cases, but some show less. Thus in his text-book on children's diseases (edition 1907) Emmett Holt mentions 8 per cent. and 14 per cent. of tuberculous cadavers at different children's hospitals in New York. But even these smaller figures are impressive.*

If 40 per cent. of cadavers are tuberculous, it is clear that 40 per cent. of children who are dying must be tuberculous also. May we assume that the same percentage of tuberculous cases, generally speaking, would be found among all sick children, whether about to die or not? It seems probable. I have here figures showing the percentage of tuberculous cases in various children's hospitals. They are taken from Sir John Byers' chapter in Kelynack's 'Tuberculosis in Infancy and Childhood,' p. 202 (London: Baillière, Tindall & Cox, 1908).

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* The Registrar-General's comparative figures of general mortality and tuberculosis mortality at ages 5-15 show that those who die of tuberculosis are about 20 per cent. of all who die. See supplement to the 65th Annual Report, Pt. I p. xiii and p. xci, and other reports show the same percentage.

Hospital.	In-patients.	Tuberculosis.
Belfast	827	26 per cent.
Belfast, Ulster	247	30 "
London, Gt. Ormond Street	2876	27 "
Edinburgh, Royal	1968	20 "
Manchester	1999	21 "
East London	2054	24 "
Glasgow	1177	28 "

The figures refer to the years 1905 and 1906.

Thus whether we consider children who have died or children who are merely ill, we find a large proportion of them—20, 30, and even 40 or more per cent.—who are dead or ill because of tuberculosis.

(3) Finally let me refer to the results of tuberculin tests. Again no table of different statistics is necessary; there is a general agreement of observers. Different groups of children yield somewhat different percentages according to their age, the form of the test, etc., but 50 per cent. may be said to be the average number of those who give a positive reaction to one or other of the tuberculin tests, though in particular groups of older children the percentages may be 80 or 90.

I am not concerned to discuss the precise limits of the validity of this test. It seems to be as well established as anything in medicine, that tuberculin in the small doses used causes no reaction in the "unsensitised" subject, and that "sensitisation" is occasioned in the great majority of cases, though apparently not quite exclusively, by a previous infection with tubercular bacilli.

It thus appears (1) that 50, or even 80 or more per cent. of children can be shown to have been infected by the tubercular bacillus; (2) that large numbers—30 and 40 per cent.—of children who die show clear signs of tuberculosis; but (3) that in spite of these large figures, an apparently negligible number of children—

say ½ per cent. or a little more—are recognised as tuberculous in school inspections. Are these figures nevertheless harmonious?

The apparent discrepancy has often been commented upon, and some observers, convinced, I suppose, that there must be more to be found in school, have mustered up cases amounting to 15 per cent., and even 30 per cent., in which the evidence seemed to them to justify a diagnosis, or at least a serious suspicion, of tuberculosis. The question, indeed, has been thought to turn on the relative accuracy of the different methods of research. But is this so?

Let us begin with the post-mortem figures and the figures of sick children. What does 30 per cent. of tuberculous cadavers—what does 30 per cent. of tuberculosis among children who are ill—correspond to in terms of children living at the same age? If we can agree on a sickness rate we shall be able to give a guess at this. It seems impossible, however, to suggest a very satisfactory sickness ratio. Three and four ill for every death are given for men in working-class life*; but I will take the largest ratio I have ever seen suggested, because it is least favourable to the argument. It is the ratio of 10 : 1 which Dr. Philip applies to the case of consumptives.†

Now the average mortality rate from all causes in age-groups 5–15, both sexes, England and Wales, in the quinquennium 1901–5 was 2·920 per 1000 living.‡

We will therefore assume the morbidity to be ten times this, viz. 29·2 per 1000; in other words, about 30 out of every 1000 children are on the sick list. But we found from the post-mortem and hospital figures that 30 or 40 per cent., *i.e.* three or four tenths, of all children ill are tuberculous. Taking, then, three or four tenths of the above 30 per 1000 ill, we get 10 or 12 as the number of those sick children who must be tuberculous. That is to say, to account for the large proportion of tuberculous among the dead, assuming of course that our ratio of 10 : 1 is correct, all we want is to postulate ten or twelve tuberculous per 1000 children living. But five per 1000 is the number we actually find attending school in Staffordshire. Where are the rest? It is surely not difficult to suppose that the missing five or seven would be found among the hundred who are constantly absent out of every 1000 children on the school rolls.

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* Notter and Firth, 'Theory and Practice of Hygiene,' p. 798. London: Churchill, 1908.

† Address to the British Medical Association, Belfast, 1909.

‡ Dr. Tatham in the Registrar-General's 69th Report, 1908 (p. lxxiii).

Thus, I consider, the effectiveness of school inspection as regards the diagnosis of tuberculosis may be vindicated. In spite of the acknowledged difficulties of diagnosis, there seems to be no real want of harmony between the findings of school inspectors and the findings of the pathologists.

Nor need we suppose a want of harmony between the tuberculin results and the findings of school inspectors. The fact is, the tuberculin test has opened up an entirely new vista. Tubercular bacillary infection is apparently extremely common; but in 99 cases out of 100 it never comes to anything, or at least its fruition is indefinitely postponed. And although it may be freely granted that the real, the serious, the clinical cases of tuberculosis all arise by selection from this vast mass of bacillus-infected material, and therefore that every bacillus-infected child is a potential consumptive, yet the matter does not end there. So is every American child a potential President. What we now want to know is, why in so many cases of bacillary infection the disaster of tuberculosis does not happen.

I regret that I have no positive contribution to make to this all-important question. We can think of this and of that as possible explanations—good food, open-air life, the accident of escaping measles, etc.—but this is not very helpful.

There is room to suspect that all these things together are not sufficient. We want some more general, some less accidental, cause of safety. Why not idiosyncrasy? It is old-fashioned, I know, but I do not see why idiosyncrasy—tendencies and capacities possibly inherited—should be banished from the list of causes. The popular impression of "type" and "tendency" in connection with tuberculosis is as firmly rooted, not only in the popular mind, but, I imagine, in that of most family doctors also, as ever the impression of infectiveness was. Perhaps the idea of idiosyncrasy is only waiting for its Villemin or its Koch ; and after all, there are few things more solidly based in medical experience than the belief that one man's meat may be another man's poison.

To return to the comparison of clinical and tuberculin findings. If we understand by "tubercular" the undisputed *clinical* phenomena of tuberculosis which we all know so well, a frank recognition of the essentially "pretubercular" nature of the processes newly brought to light by the tuberculin tests is what is wanted to reconcile all the facts. We want a new terminology, and, since Koch's bacilli undoubtedly figure at all stages, we want a term to describe the preliminary phase, which is not, and never has been, "tuberculosis" according to the old idea.

Perhaps the striking analogy pointed out by Dr. Franz Hamburger in Vienna last year will help us. He has insisted on the resemblances between syphilis and tuberculosis (in the new, extended meaning of the latter term). Each of these formidable diseases begins with an infection, a primary stage with regional glandular swellings, and immunity to fresh infection. Each has a secondary stage marked by a tendency to relapses. And each has a potential tertiary stage which in many instances in both diseases never appears. "Tuberculosis," as we have known it hitherto, is the assemblage of tertiary symptoms.

But this very striking and thought-provoking analogy must not blind us to the practical fact that in the tubercle-bacillary disease the secondary stage is in many cases apparently quite uneventful and innocuous. It is as if we were dealing with a syphilis in which nearly everyone was syphilised in early life, and yet in which great numbers of those infected never showed tertiary symptoms.

Until someone has hit on the ideal terminology I shall venture to use the term "tuberculosis" as it has been understood clinically, and to speak of the antecedent stage as "pretuberculous." For obvious reasons this terminology is open to serious objection.

DIAGNOSIS.

In the few remaining minutes I will say a few words about a school inspector's experience of the difficulties of diagnosis. And first as regards clinical tuberculosis proper.

Perplexity and hesitation as to diagnosis commonly arise in regard to abdominal and pulmonary cases. In both it is simply impossible to attempt a definite diagnosis in the early stages. Dr. Emmett Holt, in his chapter of Kelynack's 'Tuberculosis in Infancy and Childhood' (p. 98) already referred to, says: "A diagnosis of (pulmonary) tuberculosis by rational symptoms alone is almost impossible. We recognise it often by knowing where to look for it." This we school inspectors find to be literally true. And the same words might be used of abdominal cases.

It is rare for the school inspector to be left to feel the suspicion of tuberculosis steal into his mind unprompted. Generally the head teacher has some hint to give, or the mother has been alarmed. Then after this warning comes the general aspect of the child—the anæmia, emaciation, "tubercular" look, the family and immediately antecedent personal histories. It must freely be admitted that these things are the strongest factor in our judgment.

Then comes the examination of the child. In abdominal cases it is extremely rare to have more to go on than distension, diarrhœa and colic pain. Occasionally a gland may be suspected. Ascitic fluid I cannot recall a case of.

As to pulmonary cases there is more to be said. Auscultation is a greater aid than percussion. Limitation of symptoms and signs to one side of the chest would weigh heavily in the scale of tuberculosis. Apical signs would be suspicious, especially if on the right side; so also consolidation resolving very slowly. As to the signs themselves, any deviation from the indescribable soft, gentle soughing of the air in healthy vesicular respiration would be taken as noteworthy and important—diminished breathing, harsh breathing, broncho-vesicular, delayed or prolonged expiration, and, of course, any moist sounds would be regarded as of bad omen. But over all would be the shadow of the history and the appearance of the child. If this was gloomy slight local signs would be weighted heavily; if it was encouraging local breath-sounds would be discounted. Sputum is rarely available, and might not be decisive if it were, considering the stages of lung affection we have to investigate. The evidence is all most slender and in a sense unsatisfactory.

There is also another point. In school inspection we have to consider the parents' dread of the name consumption; we dare not, and we ought not to, alarm parents without good grounds. Moreover, we have to consider that we are addressing parents without having the advantage of talking to the family doctor, who may have given prolonged study to the case. These considerations tend to make us wait for a decisive impression before we declare an unfavourable opinion. Our recorded figures are, therefore, probably minimal ones.

Lastly, I come to the entirely new vista of facts opened up by the tuberculin test. A very large number of children, there can be little doubt, have received an invasion of tubercle bacilli which they have for the moment triumphantly suppressed. How and where these bacilli entered we commonly do not know. What has become of them? Where are their remnants now? Is there any lingering vitality in them? The inducement to find some possible location for them is almost irresistible, and there are not wanting observed facts which offer themselves to any theory.

When I came to examine so many reputedly, and I might say manifestly, healthy and normal children, I was astonished to find in how many cases the cervical glands are palpable, especially in the younger children. Our general totals, including the findings of all members of the staff, do not give a fair account of the absolute numbers, since some of us recorded only those glands which were grossly enlarged and of immediate clinical importance. But those of us who gave special attention to the matter could find 50 per cent. and more in children of 5–6. Even the sum of our united findings runs up to 26 per cent. at age 5–6, 23 per cent. at age 8–9, and 12 per cent. at age 12–14. Of course in many of these cases there were nits and lice in the hair, carious teeth in the mouth, and enlarged tonsils to suggest a possible cause of cervical glandular enlargement, but in many cases there was no such explanation.

A still more weighty fact which came to light in the examination of the apparently healthy, or almost healthy, was the discovery of large numbers of children showing patches of chest surface which do not resound to a blow of the finger-tip like the neighbouring or symmetrical parts. The surface just below the collar-bone is especially liable to show this peculiarity, but that is not the only situation. The breath-sounds are not in any way remarkable; a chest apex which showed this dulness on percussion, or impaired note, whichever it may be called, and in addition showed altered breath-sounds, would not be included in this class of children with "dulness in patches." The cases I refer to are cases of impaired resonance and nothing more. Not all the children exhibiting this sign are in robust health of course; some have tonsils and adenoids, others are rickety and puny, etc., but many children showing it have none of these characters of ill-health.

Dr. Elizabeth Moffett, one of our inspectors who was specially interested in this symptom, found it in 1164 children out of 5350, or in about 21 per cent., in the year 1910.*

Whether these signs have any bearing on the discoveries of the tuberculin test I am quite unable to say. But if a child were delicate-looking, cachectic, had a little cough, was off its food, sweated a little at night, and had a patch of dulness beneath its right collar-bone, no one could be blamed for entertaining a suspicion of tubercular bacillary infection.

And yet it might not be so. At the Mannheim School Clinic in 1910 a series of 236 children of age 6–15, selected because they were more or less strongly suspected to be tuberculous, were subjected to von Pirquet's inoculation test, and in spite of their suspicious signs the reaction was negative in about 42 per cent. of cases.†

The tuberculin test may be expected to clear up many of these suspicious cases. But it is, of course, the negative test which is the most decisive and useful at present. A positive reaction might merely indicate a long antecedent infection having nothing to do with the present pulmonary signs, or the present abdominal distension; but a negative reaction would almost certainly exclude the possibility of the present symptoms being due to bacillary infection.

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* A full discussion of this sign would lead us too far afield. We have not as yet worked up the whole of the material, but in 210 consecutive unselected cases of children of 8 to 9 years showing this sign (boys 123, girls 87), I find that the sign was present 84 times at the right apex, 80 times at the left, and 177 times at other parts of the chest, some children having more than one patch.

† Wimmenauer, "Über Tuberkulinimpfung nach v. Pirquet bei Schulkindern," 'Zeitsch. f. Gesundheitspfl.,' 1912, p. 245.

The sort of results which are obtained by the tuberculin test applied by von Pirquet's method of inoculation may be illustrated in the following table from the important paper of Wimmenauer to which I have just referred. All the 236 children were suspected of being tuberculous. Two hundred and thirty were examined on the day of inoculation; in 79 of these nothing was detected in the chest, 116 showed some alteration of normal breath-sounds in one or both apices, in 35 there were bronchial catarrhal signs. Of those who exhibited auscultatory signs 11 showed them in both apices, 93 in the right apex only, and 12 in the left only.

The auscultatory signs were more or less impure or diminished breath-sounds, exaggerated expiration, prolonged expiration, either with or without moist sounds. The moist sounds were chiefly fine crepitations at the end of inspiration, or in the course of, or at the end of, expiration. Only exceptionally were the breath-sounds more or less bronchial or suppressed.

When the results of inoculation were classified, the grouping was as follows:

	Von Pirquet's reaction.	
	Positive.	Negative.
No pulmonary signs	38, 48·1 per cent.	41, 51·9 per cent.
Apical ,,	75, 64·7 ,,	41, 35·3 ,,
Bronchial ,,	19, 54·3 ,,	16, 45·7 ,,
Other ,,	4, 66·6 ,,	2, 33·4 ,,
	136	100

It will be seen that in group (1)—no pulmonary signs—there is a slight preponderance of negative reactions, whereas in all the other groups, with various signs present, the preponderance is in favour of positive reactions. But the numbers of the cases are small enough to entail the error of small numbers; we must not rely too much on the constancy of these proportions. I think the impression left on my mind by a study of the table is rather one of surprise at the approach to equality of positive and negative cases. The one inference we can venture to draw with confidence is this: that, when 15 per cent. and 30 per cent. of children in school are, on more or less slender clinical evidence, suspected of being tuberculous, a very considerable number of the cases are almost certainly not so.

THE SPECIAL FACTORS MAKING FOR THE EXTENSION OF TUBERCULOSIS IN THE SCHOOL AND THE MEASURES FOR PREVENTION.

By J. E. SQUIRE, C.B., M.D.

In inviting a consideration of the special factors which may make for the extension of tuberculosis in the school, it is, perhaps, not out of place to ask at the outset whether there is evidence that tuberculosis does spread in schools. The age-periods from five to fifteen years show a progressive diminution in the death-rate from tuberculosis as compared with that of the first five years of life and a smaller death-rate from tuberculosis than occurs in the succeeding age-periods.

The school age thus represents a period of life during which tuberculosis is less fatal than it is before and after this period. This does not, of course, prove that the disease is not prevalent during school age, though I believe there is a tendency to over-estimate its extent. For example, Dr. R. W. Philip, in his paper read before the recent Tuberculosis Congress in Rome ("Tuberculization and Detuberculization," 'Brit. Med. Journ.,' April 20th, 1912) says: "By the time the fifteenth year is reached 75 per cent. of children have been tuberculised"; and again, "The collective evidence from different countries goes to show clearly that it is possible to recognise clinically the existence of tuberculosis in the majority of school-children." I am unable, from my experience in London schools, to agree with these statements.

Extension of tuberculosis in school may be considered from the point of view of infection transmitted in school and from the broader standpoint of conditions which might tend to light up quiescent or latent tuberculosis into activity.

There is little evidence that infection occurs in school to any appreciable extent; on the other hand, there is abundant evidence of the opportunities for infection of school-children in the homes of many of those attending our elementary schools. The primary requirement for preventing the infection of school-children with tuberculosis is to be sought in improving the condition of their homes.

Nevertheless there may be circumstances connected with school life in the elementary and secondary schools which might make for the extension of tuberculosis amongst the children, and however slight and infrequent these factors may be, if they are avoidable they demand attention.

The tables of tuberculosis mortality during the school age are worthy of note, not only in comparison with the periods before and after this age-period, but also as indicating the gradual increase of pulmonary tuberculosis (phthisis) as age advances and the gradual decline of other forms of tuberculosis.

The figures for 1909 will serve to illustrate these points :

	Deaths under 1 year of age per 1000 births.	Death-rate per 1000 living.							
		1-5.	5-10.	10-15.	15-20.	20-25.	25-35.	35 and up-wards.	All ages.
All causes . .	108·73	15·98	3·31	1·96	2·73	3·38	4·88	26·50	14·62
Phthisis . .	0·29	0·23	0·15	0·27	0·80	1·22	1·64	1·74	1·09
Other forms of tuberculosis .	3·71	1·57	0·46	0·31	0·25	0·18	0·19	0·17	0·45
			School age						

It is well to bear in mind that, according to v. Behring and those who agree with him, the vast majority of cases of tuberculosis result from infection in the first few years of life. If this be correct there is no question of infection at school—the mischief is already done. Yet the conditions at school might light the smouldering disease into activity.

Here we open up an aspect of the subject which demands attention, viz. to what extent the conditions of school life may determine the onset of active disease in those infected outside the school or may increase in others a predisposition to become infected.

To the extent that the conditions act in this direction we are justified in crediting school life with furthering the extension of tuberculosis.

Let us consider in the first place what are the possible sources of infection in the school. The predominant characteristic of tuberculosis in childhood is the tendency to localisation of the disease in glands, bones, and joints, or in the skin. Pulmonary tuberculosis becomes increasingly evident from ten years of age onward, but is never so prevalent as it becomes in adults.

So-called surgical tuberculosis is not infective to others, unless there is some discharging wound or sore, and it is not difficult to exclude from school attendance any children with such conditions. The problem of the disposal of such children must, however, come within the duty of the Educational Authorities, since they have an equal right with others to be educated.

Pulmonary tuberculosis is also not necessarily infective. Young children rarely expectorate, and the type of the disease in children shows a less tendency to become "open," *i.e.*, to be accompanied with the expectoration of germ-laden sputum, than the adult type.

The systematic medical examination of school-children on entrance and the periodical inspection of schools by the medical officers should minimise the possible risk of any infection from child to child in school by leading to the detection and exclusion of any infective individuals. All children with cough should be specially referred to the school medical officer for examination.

As a rule a child will not expectorate infective sputum until the disease has been active for some months, and by this time the effect on the general health will, in all probability, have caused the child to discontinue attending school. In my opinion there is little risk of the spread of tuberculosis in schools arising from the presence of tuberculous children.

The presence in a school of a consumptive teacher, on the other hand, constitutes a serious risk to the children. School teachers appear to suffer from consumption in greater proportion than the average of the population. School medical inspection should include the teachers as well as the scholars, and any teacher found to have tuberculosis of the lungs should be removed from the schools. Some scheme of pensions for such invalided teachers is necessary to prevent hardship; but for the sake of the children no consumptive teacher should continue at work in school. There is probably also some danger of a school-room becoming infected if any school-keeper, cleaner, or scrubber is affected with tuberculosis of the lung. In this connection also one must refer to the possible risk from the use of school-rooms out of school hours by adults, whether for evening classes or for meetings, entertainments, or as polling stations at elections, since the exclusion of consumptive individuals cannot be ensured. Schools used for such purposes should be disinfected before being used again by the children.

The proper cleaning of school-rooms should receive attention. Dry sweeping and dusting, especially when carried out with closed windows, cannot be considered satisfactory. In cold weather it is not unknown for all windows and ventilators to be closed as soon as the children leave, and for these to be kept closed until they return next day. The regulation which demands a given temperature of the room when the school assembles often results in a sacrifice of ventilation for the sake of warmth.

The most scrupulous attention to the avoidance of any possible source of infection in the school is the more necessary since the children are, from the circumstances of their home life and environment, often predisposed to suffer from tuberculous infection. Some of the children may already have tubercle bacilli in their tissues, the development or destruction of which will be determined by the increase or otherwise of their resisting power. The hygienic conditions in school should be such as to counteract and remove such predisposition and to strengthen resistance. I am strongly of the opinion that the elements of hygiene should be taught in all our elementary schools as a compulsory subject; but I would also insist that the school-life and the conditions under which the daily school work is done should furnish a continuous object-lesson on the hygienic principles which are taught.

Teachers require to learn hygiene and to believe in its practical utility before they can teach it effectively.

Probably the most useful and most important function of the school in the campaign against tuberculosis consists in combatting and diminishing predisposition in the children.

Though the proportionate number of tuberculous children attending the elementary schools may not be large, there is an immense number of children whose resisting power against tuberculosis is small. Amongst the poorer children in our large towns the resisting power against disease, including tuberculosis, is very low. The causes of this are obvious to all who know anything of their home conditions.

There are those who would seek the remedy for this in free meals. "Man does not live by bread alone," nor is the problem of the interdependence of ill-health and poverty to be solved by providing food. This is one of the requirements, but by no means the only one; nor, I venture to think, is it the most important and urgent. For the more delicate children especially, removal from their unhealthy environment for a time is required.

The first requirement is that the child should grow up – if possible that it should grow up strong. The value of education is small to the child that dies before it reaches the period of productive work.

In 'School Hygiene' for May, 1912, there is a suggestive article by Dr. Letitia D. Fairfield,* from which the following table is extracted (p. 94).

From this it appears that we spend over £30,000 per annum in London alone on the education of children who die of tuberculosis before they can put this education to any practical use.

Surely an expenditure of, say, £20,000 per annum in saving the lives of these children would be justified. For such a sum residential schools in the country and at the sea-side for poor children attacked by, or threatened with tuberculosis could be built and maintained. The matter is worth consideration.

For the less delicate much can be done to build up their resisting power by open-air day-schools. An experiment has been

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* "Infectious Disease, Tuberculosis, and Education."

TABLE B.—*London,* 1900–09.

		Deaths.				Years of schooling lost.	Cost at £4 15s per head per annum
		5–10.	10–15.	15–20.	Total.		
Tuberculosis	Phthisis .	811	1000	3451	5262	47200	£224200
	Other forms	2739	1176	1039	4954	21680	£102985
	All forms .	3550	2176	4490	10216	68880	£327185

Each child who died in the 15–20 period was assumed to have had ten years of schooling, but no schooling was reckoned below five years of age. To allow for the fact that deaths are scattered irregularly throughout the year, a correction was made (in the usual actuarial method) by assuming that those dying between five and six had had a half year's schooling, those between six and seven had one and a half year's, and so on. The cost was arrived at by multiplying the years of schooling by £4 15*s*., the average cost.

in operation for the past eighteen months in connection with the St. Marylebone Tuberculosis Dispensary (London), which illustrates the possibility of holding school in the open air throughout the year, and the advantage to the health of the children. Some thirty or forty children excluded from school for tuberculosis attend an open-air school in one of the parks (Regent's Park), under a teacher provided by the dispensary. The class has met regularly throughout the year—winter and summer. The children bring their dinner and eat it in the park, and the class is so appreciated that it went on throughout the summer holidays.

The advantages of this open-air class may be shown by the increase in weight of the children, but is much more convincingly apparent in the improved appearance and spirits of the children themselves and in their increased mental alertness.

Cases of "surgical" tuberculosis—spine, hip, etc.—even when arrested, are best away from the ordinary school, since they may be injured by the rough play of the healthy children, with consequent risk of lighting up afresh the quiescent disease. For these the physically defective (special) schools are most suitable.

For those children whose home conditions are such that their chances of improvement are seriously diminished whilst they remain at home, residential schools in some healthy part of the country or at the seaside are required. The Paris Municipality has recognised the importance, from the preventive side, of caring for the predisposed children of the poor, and has founded an institution for their reception on the coast at Berck-sur-Mer.

For the predisposed children some arrangement for boarding-out in the country, where they could attend school in the village, would seem to be feasible, and would do much for the town children's health, even if each child only went away for a month.

In considering this question of tuberculosis in relation to school-children, one must bear in mind the protracted nature of the malady. We cannot exclude a tuberculous child from school as can be done in a short illness, such, for example, as mumps, without seriously affecting his education. It is well to remember, also, that amongst the poor the home conditions are often such as to encourage the disease, and are generally less hygienic than the conditions existing in the school. It may therefore be to the physical as well to the educational advantage of the actually or potentially tuberculous child to allow it to attend school. In many cases the disease does not affect the general health to such an extent as to prevent a child doing the ordinary school work; in other cases some modification in the amount of work and in the conditions under which work is carried on are desirable. For these latter cases special schools—invalid schools and open-air schools—must be provided.

Whilst giving due consideration to what is best for the tuberculous child, we must not lose sight of the interests of the other children and the possible risks of infection. This is perhaps most essential in the poorer neighbourhoods, where many of the children attending school are weakly and predisposed.

We must agree, however, that risks of infection in a well-arranged and well-managed school are not great and may be easily overrated.

Children are not so readily infected with tuberculosis as with measles, mumps, and many other diseases; when infection does occur it is usually the result of continuous and prolonged exposure to the source of infection. This is not so likely to occur in school as in the home where one member of the family is already consumptive, and with a few simple precautions even certain cases in which infectious material is being given off (open tuberculosis) need not necessarily be excluded from school. For example, a child with a discharging wound from a scrofulous gland, or from tuberculosis of the hip or ankle, would not constitute a danger to others so long as the wound is properly "dressed" and is not uncovered whilst in school. Even some cases of tuberculosis of the lungs might safely attend school; for children—especially the younger ones—rarely expectorate even when they have a cough, and in many cases of pulmonary tuberculosis there may be no cough. Many of the cases of tuberculosis in children, probably the great majority of those who are not too ill to be able to go to school, belong to the class of "closed" tuberculosis, from which no infective material is given off, and these are not dangerous to others.

Thus, though we must exclude those who might constitute a danger to their school-fellows, we should avoid the alarmist mistake of considering every individual with tuberculosis as a danger to be shunned and to be kept at a distance.

In the consideration of the school in relation to tuberculosis we must also bear in mind the many children attending our elementary schools who, though not tuberculous, are, by reason of their poor physique and the insanitary environment in which they live, in danger of becoming tuberculous if exposed to infection—especially those who are living with consumptive individuals. Such children are often spoken of as being "pre-tuberculous." The combatting, and, if possible, the extinction of predisposition by improvement of the general health constitutes one of the important health-problems in school work.

Spinal and hip disease as well as other forms of joint and bone tuberculosis generally commence in early childhood—from one to six years of age—so that the active state of the disease is over before the child is of an age to be sent to school, though the resulting deformity or lameness remains. It is well to remember that there is a tendency for the disease to break out or become active again after it has been apparently cured. This may result from some injury, from over-exertion, or after some acute general illness, and indicates the necessity for care in these cases of old tuberculosis. It is for this reason hardly desirable that children who have suffered from spinal tuberculosis or hip-joint disease should be admitted to the ordinary elementary schools, where they may suffer from the rough play of the stronger children. About 50 per cent. of the children admitted to the physically defective schools in London are the subjects of "surgical" tuberculosis (Elmslie). It is worth while to bear in mind also that much of the deformity and crippling which follows tuberculosis of the spine, hip or knee might be prevented if treatment were commenced early and were continued sufficiently long. This treatment may prevent the child attending school, and it is desirable that arrangements should be made for such children to continue their education in the hospitals and homes where such treatment is carried out.

Active *tuberculosis of the lymphatic glands* does not appear to be very common amongst children of school age. Hardness of the cervical lymphatic glands is very frequently met with amongst children attending the elementary schools in London and elsewhere. In a systematic examination of a large number (1670) of children, a report of which is published in the 'Transactions of the Second International Congress on School Hygiene' in 1907, I found that 75 per cent. of those examined had enlarged and hardened cervical glands, and 43 per cent. had enlarged tonsils. We should not be justified in attributing all—or anything like all—these cases to the effects of the tubercle bacillus, though all are probably due to bacterial infection of some kind. The septic atmosphere of the home and the consequent constant breathing of a bacteria-laden air is a cause of chronic tonsillitis, adenoids, and hardening of the lymphatic glands in the neck. These conditions are sometimes caused by the tubercle bacillus, but they are more commonly due to other bacteria. In this latter case these other bacteria open the way for the entrance of tubercle bacilli, and thus render the children liable to suffer from tuberculous infection.

A minor point which I think requires consideration here is the possible spread of tuberculosis from the method of dealing with the children suffering from enlarged tonsils and adenoids. Many of these children are very properly recommended to have these growths removed. As an immediate result of the operation a temporary local vulnerability to infection may be produced at the seat of operation. Many of these children come from infective homes. Keeping them away from exposure to infection after operation until the wounds are healed appears to be desirable, yet from the impossibility of finding accommodation in hospital the majority of the children return at once to their homes.

In conclusion I assert again my conviction that the extension of tuberculosis in the schools is not a factor of great extent in determining the prevalence of the disease amongst children of school age. It is in their homes that we must seek the causes of this prevalence; it is there that we shall find the sources of infection and the factors which create predisposition.

It is during the period of growth and development that the resisting power of the body may be strengthened, or on the other hand rendered less efficient, by the conditions under which the child lives. The septic atmosphere of the home and the dirty clothing of some of the children attending school, as well as any deficient personal cleanliness, not only militate against healthy life and growth, but are causes of frequent bacterial infections, which gradually weaken the resisting power of the individual against disease, and which produce certain tissue changes facilitating the entrance into the body of tubercle bacilli.

PLACE OF SPECIAL SCHOOLS IN THE PREVENTION OF TUBERCULOSIS.

By Mrs. LESLIE MACKENZIE,

Convenor of Health Committee, Edinburgh School Board.

Mr. President,—It was a shock to me to get the programme of this Conference and find myself "down" to give a paper on "Hospital Schools."

What I did hope to be allowed to speak about was: "The place and construction of special schools in the prevention of tuberculosis."

What I think we mean by hospital schools as such, are schools or classes actually attached to, or conducted in connection with, sick children's hospitals, children's sanatoria, or children's convalescent homes. Probably it is the same thing, but I wish you to understand that of what may be properly called hospital schools I have not had much direct personal experience. But a name that quite properly fits both types of institution is "health schools." Indeed, I am not sure that this is not the more appropriate term of the two; for, at this Conference, we represent mainly the preventive side of medical service, and, on the preventive plane, a hospital is a health institution. But we need waste no time in discussing titles. Our institutions are many; our aims are one.

Let us take, then, a few types of special school, and indicate how they may be made to serve, and do serve, the purpose of preventing tuberculosis.

In an admirable book entitled 'Tuberculosis in Infancy and Childhood,' published in 1908, by Dr. Kelynack, one can gather from the various contributors a fairly accurate estimate of the history of the movement. France, Germany, Switzerland, Norway and Sweden and the United States have each in turn recognised that, as Pasteur said, "If you wish to have the silkworm you must preserve the cocoon," and established their sick children's hospitals either at the seaside or on the hillside from which the children come back healthy and rosy.

For many years at home we have been accustomed to our children's convalescent homes in the country, with their splendid results in giving health, but with their complete standstill to education.

Where there is great suffering and disease, of course there is no question of schooling; but during convalescence from the major infections, and where the illness has been local tuberculosis, or anæmia, or general debility, some systematic teaching in healthy conditions would do no harm. This combination of health recuperation with some systematic education is the basis of our open-air schools or health schools.

In Norway and Sweden the children in the tubercular hospitals have one and two hours' teaching daily in the open or on the verandahs. Some of these institutions have nurse teachers as part of their staff. In all these institutions, and wherever the experiment is tried at home, doctors are unanimous in the good effect of this systematic occupation on the spirits and health of the children. The dreary, monotonous lying on couches and the continuous, aimless and usually restricted play of children in hospital becomes a weariness of the flesh; the spirit flags and the cure is retarded.

The schooling, when in proper healthy conditions, in proper amount, with due attention to periodic rest and play, really becomes a useful factor in the cure, just as the correctly regulated amount of outside work has become a recognised factor in the treatment of consumptive adults.

In the great cities it is not, of course, immediately possible to develop all the institutional ideas here indicated; but the special schools for cripples, anæmics, convalescents and mentally defectives offer an admirable opportunity for the prevention of tuberculosis, which, it is needless to remind you, is exceptionally prevalent amongst all those classes of children.

The Forest School of Charlottenburg has drawn admirers from all the world, and has produced its hundreds of imitations in the various countries.

It is right to record once more that the idea of this special school for children "under par"—not for tubercular children as such—originated in the mind of Dr. Neufert, the Stadt-Schulrat of Charlottenburg, and his wife, Mrs. Hedvig Neufert.

At this date it is unnecessary to give any detailed description of the educational life here made possible in the open air; but I show you a few pictures which Dr. and Mrs. Neufert specially prepared for us in order to show the leading features of the school. These pictures are now all the more interesting in that they are probably the last taken before this part of the forest was included in the expansions of town planning so rapidly proceeding at Charlottenburg. I have not seen the new Forest School, but Dr. Neufert assures me that the same principles are followed. Over the fence from the old school there was also a forest hospital for the actually sick, and no one that ever visited it can forget the sight of year-old babies peeping through the meshes of the closed-in hammock nets swung from fir-tree to fir-tree.

In the great cities it is not possible to plant pine forests, and it is not possible to exploit our climate quite to the same purposes as the climate of Brandenburg, but there are many ways of realising open-air principles, and in the short series of pictures I now put before you I wish merely to show what is practicable in the ordinary course of a city School Board administration in Scotland.

The Edinburgh School Board began their special school work by reconstructing an old disused parish school known as Willowbrae. It was beautifully placed in a large garden not far from the foot of Arthur Seat Hills. The conversion of large windows into French window doors gave all the rooms direct access to the outside and secured plenty of fresh air. Instead of the usual "sea of cement" playground, this school had its nicely laid-out garden, carefully worked and kept by the janitor and the older children. A large Speirs play-shed in one corner of the garden served as a school hall, a play-place in wet weather, and a class-room for open-air teaching of nature knowledge. The children come to school by ambulance in the morning and return home by ambulance in the afternoon.

A forenoon "piece" consisting of bread and butter with milk is given at 10.30; at 12 o'clock dinner is served, consisting of two courses of well-cooked, wholesome food. Emulsion is administered to certain children selected by the school doctor.

Lessons are given according to a regularly arranged time-table, where proper attention is paid to the necessary time for rest and play.

The Board aimed at carrying out the idea of health recuperation along with a certain restricted amount of school work. The results here were so successful that very soon another special school was decided on.

In the 'Blue Blanket'—the Edinburgh civic review—for April, 1912, I have given a detailed description of these schools, and I may quote the following paragraphs:

"The next district considered was on the south side of the city, and, in Duncan Street, three adjoining, more or less dilapidated, villas were bought by the School Board. The situation here was perfect. Each house had a fine old garden lying to the south. Reconstruction had to be a little more radical than at Willowbrae, and the fine possibilities of the situation have been fully realised. Duncan Street is a model of its kind. Experience in Willowbrae and a fuller conception of the necessities of these schools led to a new experiment in school building. The beautiful sunny gardens seemed the true place for invalid children, and the schoolrooms were so designed as to give the value and sense of 'garden' all day. The building is in two storeys. All the rooms are on the south side, and the south wall of each room is a large glass folding door, which at a touch rolls back and leaves the rooms on the ground floor practically continuous with the garden. Those on the top floor open out in the same way on to a covered verandah. There is excellent natural ventilation; there is good light, and the heating is by open fires, supplemented by hot-water pipes round the walls. One hopes that the experiment tried here will ultimately extend to all new schools. In Duncan Street, teachers and children have worked all winter in these 'exposed' rooms and joyed in the sensation. No more fagged brains from accumulations of bad air! And if, as some physiologists are beginning to tell us, it is not bad air that produces the fag, but something else of unknown name, the practical result is the same; for the teachers here are of one mind that they have never taught in conditions so bracing as these. Let us say it is the sunlight. At any rate, the open side if not the open door has done it. Last autumn Dr. Woods Hutchinson, of New York, visited these buildings and expressed his delight at the use made of old houses. 'I shall go back to New York and tell them what you have done and I think we can do something of the same there. But why should children wait to be sick before they are allowed to enjoy what every healthy child should have?' Early this year the Chairman of the School Board took Lord Pentland to see the schools. It was one of the cold days of last February. The Vice-President of the Council and head of the Education of Scotland was charmed to find children having their lessons on the verandah in the open air, and to all appearance as charmed with him as he was with them. Some of my friends are slow to believe in the open-air school. Let them visit Duncan Street. Surely all teachers and all children are alike entitled to the best conditions of mental work. We shall watch with keen interest the continued use of these open-on-one-side class-rooms.

"Naturally and sensibly, the north side of the building has the entrance, corridors, cloak-rooms, bath-room and other administrative apartments, which are not so dependent on sunshine. On principle, too, all our special schools have very light-coloured inside walls and woodwork. The bright, light aspect of the rooms has a very stimulating effect on the children, and at the same time a very salutary restraining effect. Cleanliness is one of the watchwords, and who would dare leave a dirty mark on beautiful paint? The children are trained to respect their surroundings and so realise themselves.

"This new school accommodates 140 children—60 mentally deficient, 60 physically defective, and 20 delicate or convalescent. There are seven class-rooms, two dining-rooms, a nurse's room, a doctor's room, and a small hall. There are seven teachers, each with a class of twenty; a nurse, and a caretaker and his wife. The mentally deficient children are kept entirely separate from the cripple and delicate children, and have a dining room and a play-garden of their own. As at Willowbrae, the gardens are simply and nicely laid out with plenty of playing space, and under the old trees seats have been arranged. The caretaker and older children are the gardeners, and here also we hope to have the civilising effect of several pets—rabbits, pigeons, and guinea-pigs—as well as the school dog and cat already established.

"So varied are the ages and sizes of these children and so varied are their physical defects that uniform school-desks are not at all suitable. Each child has a table and chair fitted to its size and condition. The chairs are light and easily moved on to the verandah, or into the garden, as required. For many of the cripples special invalid chairs and special invalid couches have to be provided; but, except for these, the furnishings of special schools do not vary much from the furnishings of an ordinary school."

I could never quite believe that the climate of Edinburgh was bad, knowing as I do that the death-rate of Edinburgh is low, and the atmosphere of Edinburgh dry, keen, and bracing. But when I tell you that the new Duncan Street School has had to close its open side only on five days since September last, I think you will share my conviction that the climate of the East of Scotland is as suitable for open-air schools as the climate of Germany. Let me add another fact. A few days ago, when these photographs were being taken, the opening side of the class-rooms had to be closed for about twenty minutes. A messenger was sent down to inquire whether the sides could be opened at once because the inmates were suffocating. It is for the physiologists to say whether the suffocation was real or imaginary. All I can say is that, after a winter's experience of cool air and sunlight, neither teachers nor pupils can "stand" the closed side.

Probably we shall continue to speak, for some time to come, of the *four* walls of a house; but we may at once begin to speak of the *three* walls of a school.

A new open-air school has just been opened at Humbie in East Lothian—a cottage group on a country hillside. It is a residential school for delicate children. They will remain for such periods as the school medical officer may prescribe. This school, like the other special schools, is under the supervision of the school medical officer, who superintends the progress of the children both in health and in education.

All these schools, therefore, although they aim at adapting the educational curriculum to the mental and physical capacities of the children, are in all essentials health schools, and will play an appreciable part in the prevention of tuberculosis and in the promotion of personal vigour. The three Edinburgh special schools I have mentioned are provided and managed by the Edinburgh School Board, and are intended for mentally deficient children, cripple children and "delicate" children, that is, children of school age recovering from any serious illness whose complete recovery would be retarded if they returned to take up the ordinary load of school work in the ordinary city school. For such children life for a month or two in one of those hygienically constructed, specially organised schools, where a sufficient supply of fresh air, suitable food, properly arranged rest time, play time and lessons are possible, gives them a chance of complete recovery without undue loss of education. In the existing special schools belonging to the School Board we have no phthisical children; but, by the courtesy of Dr. Philip, I am able to show you a picture of open-air classes conducted within the grounds of the Royal Victoria Hospital for Consumption. Here the children are all sanatorium patients under treatment for pulmonary tuberculosis and the classes are not under the School Board.

Although I have preferred the term "health school" to the term "hospital school," I have shown you that the difference is only a difference of degree, and there is no breach of continuity between the principles of open-air prevention and the principles of open-air cure.

The paper was illustrated by a series of lantern-slides.

THE HOSPITAL SCHOOL.

By E. D. TELFORD, F.R.C.S.,

Hon. Assistant Surgeon the Manchester Royal Infirmary; Visiting Surgeon the Manchester Residential School for Crippled Children.

I am much indebted to your Committee for the opportunity of addressing you on the subject of "The Hospital School" at this Conference held in Manchester, because it was in this city that the first municipal hospital school was founded some seven years ago. At that time the late Dr. Ashby was Medical Adviser to the Manchester Education Committee, and it was largely owing to his efforts that the Committee undertook the responsible, and to some extent experimental, work of founding this school. It was my good fortune to be associated with Dr. Ashby in the work of the school from its beginning, and since our great loss by his death in 1908 I have had the surgical charge of the institution.

Our hospital school, or, as we prefer to call it, Residential School for Crippled Children, deals with cases of surgical tuberculosis, with the more severe forms of rickets and with the various types of paralysis which are incident to childhood. For the purpose of this paper I will confine myself entirely to the question of surgical tuberculosis. The facts which render it imperative that the victims of this disease shall be treated in some institution designed on the model of the hospital school may be briefly stated as follows :

We have throughout this country very large numbers of children afflicted by that form of the disease which is known as surgical tuberculosis. This disease is very common, especially in the more crowded quarters of our towns. Its frequency may be judged from the fact that in the year 1910 no fewer than 285 cases of tuberculous disease of the spine were brought to the Outpatient Room of the Manchester Hospital for Sick Children.

Surgical tuberculosis occurs chiefly in the spinal column and the larger joints, and is most commonly confined during its earlier stages to a single focus. The majority of the cases begin between the ages of three and six, and the disease runs a very chronic course, lasting, it may be, for years. It is most important to realise that in the earlier stages of the disease the child's health is but little affected, the damage is confined to a single focus, internal organs, *e. g.* the lungs are seldom involved, and if treatment is sufficiently thorough the prospects of a permanent cure are distinctly good. When a cure is obtained in the early stages of the disease the resulting deformity is slight or absent, and the children will usually grow up into healthy lives, showing little tendency to relapse or to acquire any other form of tuberculous disease.

Although for the cure of this form of tuberculosis two things only are necessary—good hygiene and immobilisation of the affected part—it is unfortunately only too true that we have at present no adequate means for the treatment of these children. Under our present hospital system there is no method by which these children can obtain the simple treatment they need. The utter inability of our hospitals, both general and special, to minister to the needs of these children is a fact unrecognised by the charitable public. The wards of our hospitals are crowded with other cases of acute and urgent disease. The long list of patients waiting for admission shows the extent to which they are already overworked, and makes it impossible for these institutions to admit these children, who must occupy a bed for months if they are to receive any benefit. To admit them for a period of two or three weeks only—as is so commonly done—is to waste both time and money. Under such conditions their inevitable fate is to bandied about from their homes to the out-patient room and from one hospital to another until the disease has worked damage which is beyond repair. Very large numbers of them die of exhaustion after a long-drawn illness, and the surviving few are crippled for life. The havoc wrought by the disease in those who survive is graphically shown in a report of the Birmingham Education Committee, who found that out of 721 crippled children no less than 39·5 per cent. owed their condition to the results of surgical tuberculosis.

The facts of the problem are thus quite simple. We have to deal with large numbers of children afflicted by a grave disease, eminently curable if proper treatment is afforded early, but singularly fatal under our present lack of treatment. All that is necessary to save these children is that they be maintained in a special institution under proper conditions of hygiene and surgical treatment for a length of time sufficient for their cure. We must get hold of these cases early, place them in a specially equipped institution, maintain them there for an indefinite time—usually two or three years—and under these conditions not only will the great majority be saved, but they will be saved without deformity. The length of time during which they must be detained necessitates that some provision be made for teaching them, since they are usually quite able to profit by teaching, and are often, mentally, above the average of their class.

At the present time, with the exception of some few charitable institutions, the residential school affords the only solution of the problem.

In attempting the treatment of the tuberculous cripple the suggestion of special day schools has been put into practice by some authorities. This type of school has the advantage of dealing with a large number of cases at a relatively small cost. It aims at treating and teaching the crippled child during the ordinary school hours under good conditions of hygiene and air, it feeds them, and provides for the daily supervision of their splints and appliances. The children are carried to and from the school by some special means of conveyance.

It is much to be regretted, however, that the special day school has been regarded by some as offering a satisfactory solution of the whole problem of the crippled child. This it can never do, since it is altogether unsuitable for the bulk of tuberculous cripples. The one need of these cases is absolute rest of the affected part. How is this to be attained when the child must be carried to and from the school each day? I have seen these children in special day schools wearing various spinal and other appliances which could never be regarded as efficient under the circumstances. Further, the school can treat the child for little more than one third of the day, and for the rest of the day the child must return to the unwholesome conditions of its own home. The fate of splints and appliances under these conditions is readily imagined. The special day school is invaluable in the after-care of cured or convalescent cases, but it has no place whatever in the treatment of cripples who are suffering from active and progressive tuberculosis. The only satisfactory method is to admit the child to a specially equipped institution, the residential school, in which it can remain for an indefinite length of time under conditions ideal for its cure.

I do not propose to take up your time with a detailed description of the residential school as we have it here in Manchester. The schools are here for you to see, and I have on previous occasions* published full details of their methods and administrations and these may be consulted by anyone interested in the subject. I would merely ask your attention to the following points, which illustrate the main features of our Residential School.

The school is housed in two large private residences on the north side of Manchester and accommodates 114 children. The houses stand in fourteen acres of ground, and possess excellent sheltered lawns well adapted for open-air treatment. The houses have, with certain structural alterations, afforded large, light and airy wards. The staff consists of a matron, fourteen nurses, and the necessary in- and out-door servants. The cases are treated in the main on non-operative lines, but such operations as may be required are done at the Manchester Royal Infirmary. The School clothes and feeds the children, and has its own herd of cows, thus insuring a supply of sound milk. The children are taught by members of the Elementary Education Staff who have been specially selected for their aptitude in dealing with backward and ailing children. The teaching is done as far as possible in the open, and the children live in the open air as much as climatic conditions will allow.

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* 'The Problem of the Crippled School Child,' Sherratt & Hughes, Manchester, 1910; "The Residential School for Crippled Children," 'The Child,' November, 1911.

The cases admitted are those of early surgical tuberculosis before the advent of abscess or serious deformity, and the average time required for treatment is two years.

From my experience of seven years' work at the Manchester Residential School I am of opinion that the main features requisite in a hospital school are as follows :

The building.—This should be specially designed and built for the purpose. The site should be in the open country, preferably on high ground, and a sufficient extent of land should be secured to maintain the open character of the site. All wards should be on the ground floor only, and should have free access to the open to facilitate the moving of beds backwards and forwards. Fifteen beds in each ward will be found a convenient number. A bathroom should open out of each ward, and cupboards and shelving for the storage of school-books must be provided.

The school should be so planned as to afford every facility for treatment by open-air methods. A large lawn should be designed ; it should have a south aspect, and must be provided with efficient shelter from the prevailing winds. A large area should be set apart as a playground, where the convalescent children may play without restraint or risk of damage to any cultivated portion of the grounds. If the open-air treatment is to be carried out to its proper extent the provision of verandahs is essential. These must be roomy, open, and provided with sun-blinds. An observation ward, in which new cases may be watched for fourteen days after admission, must be provided, and there must be accommodation also for the temporary isolation of any sick child or of any case of contagious disease.

Other necessary offices include school-room, cloak-rooms, ward kitchens, linen and splint-room, together with the necessary accommodation for the matron, nurses and indoor servants.

Surgical appliances.—The appliances used in the treatment of the children are, fortunately, neither many nor elaborate. Quite efficient appliances and splints can be made very cheaply, and their construction is seldom beyond the capacity of the average joiner, blacksmith or bootmaker.

Dressings.—The dressings are of the simplest description, and it will be found that with judgment in the selection of cases the time occupied in applying dressings and the cost of the materials can be much reduced.

Clothing.—All clothing must be provided by the school. The parents of these children can seldom be relied upon to provide proper and efficient clothing.

Provision for surgical operations.—Unless the school is large enough to demand the services of a resident medical officer no major operative work should be attempted at the school. The number of major operations performed on cases of surgical tuberculosis is small at the present day, and the cost of equipment and maintenance of an operating theatre for so small an amount of work would be prohibitive. If the visiting surgeon is, as he should be in every case, an operating surgeon on the staff of a general or children's hospital, it can be arranged that the necessary operations are done by him at the hospital, and the children returned to the school within a few days.

The cost.—The cost of the hospital school is, of course, considerable, and works out at an average of £30 per bed per annum. This cost cannot be considered high when it is remembered that the residential school does afford the only efficient means of treatment, and it is not easy to see how under the peculiarly chronic conditions of the disease and the necessity for the entire maintenance and education of the child the cost can be made any less.

The results.—The results obtained by the school have been published from time to time in the Annual Reports of the Manchester Education Committee. I do not think that anything is to be gained by recapitulating these figures, but for the purpose of this paper I have made a strict and careful inquiry into the results of certain cases of tuberculosis of the spine and joints which were admitted in an early stage of the disease. It is, after all, the aim of the residential school to obtain these cases early, and it is of the highest importance to know what may be done with the disease when it is placed under good conditions at an early stage. I have inquired into the history of twenty cases which we obtained within six months of the onset of the disease, and which we treated and discharged not less than two and a half years ago. Of these cases sixteen are well and apparently quite cured, three have relapsed, and one is dead. This gives a percentage of 80 per cent. of cases known to be well two and a half years after discharge. These figures, though not so optimistic as some figures published for the results of surgical tuberculosis, are, I think, nearer the truth.

From the point of view of the surgeon the residential school, on its present lines, has two obvious limitations. The school cannot admit children until they are five years of age, and it is, therefore, unable to deal with the numerous cases which begin before this age. Further, the school is a school first and a hospital afterwards, and the fitness of the child to be taught must determine its admission to the school.

Finally, with the exception of some few institutions on similar lines, the residential school does afford the conditions requisite for the cure of surgical tuberculosis in childhood, and is at the present time the only means of bridging what is a conspicuous and lamentable gap in our hospital system.

DISCUSSION.

Mrs. Richard Shutt (Salford Board of Guardians): They had been told from this platform that morning and that afternoon that it was owing to lack of vitality that the child was unable to resist the onslaught of tuberculous germs. She believed it was owing to the great poverty in the homes of the poor that they heard so much of tuberculosis among the children and of consumption among the adults. She would tell them of a case that occurred in the Salford Union that would help to illustrate what she meant. About eleven years ago a woman who had been left a widow with four little children—they certainly were not very strong—came to the Salford Union soon after her husband's death. On the birth of the next child, after the husband had been dead a few months, they adopted it—a little girl, a fortnight old. That little girl, owing to its different environment and being well nurtured, was now a child in the very best of health and quite a pride to her foster-father and mother. The others went out of the union with their mother, who made a heroic struggle to maintain the home by work at the wash-tub. The three of them died in Hope Hospital of tuberculosis, and the mother died of consumption. This showed the chance the one child had from being properly fed and housed.

The great thing they ought to consider was, first of all, how to feed the poor children without pauperising them. With the wages of some of their working men, who were really earnest and industrious, it was absolutely impossible for them under present conditions to give their children nourishment sufficient to strengthen them to throw off the onslaught of tuberculosis.

Tuberculosis was really the poor man's scourge, and the sooner they tried to feed the children and educate the mothers in the home, many of whom were thrifty and industrious and were glad of any lesson they could give them, with an adequate amount per head to provide for the children being properly fed, the sooner, she thought, would it be unnecessary to spend so much money on big institutions.

Alderman J. R. Hurry, J.P. (Mayor of West Ham): They had heard a great deal about the application of science to the cure of consumption, but he would like to say a few words on the preventive side. The National Association had done a great deal towards letting the people know the best means of prevention, towards getting bodies like the various councils and authorities to place upon their public buildings and in their public vehicles notices against spitting. He believed this was doing a great amount of good, but he was quite sure the local authorities had left out of account one of their greatest assets for the prevention of consumption. During the last few days he had been in Paris in connection with a municipal competition, and he remarked on the very small amount of expectoration one noticed in the streets of Paris. He wondered why there was less expectoration in Paris than in London and England generally, and having the pleasure of meeting the Minister of Education, received a permit to attend their elementary schools. And there he found work being done which certainly could be done in this country. The possible means of preventing the scourge of consumption was being taught in practically the whole of the elementary schools of Paris and its environment. All round the school building, in every class-room, was the same notice which is placed in our public buildings: "Please don't spit." And in connection with that the teachers were teaching hygiene to the children. He thought our local authorities should advocate more teaching of hygiene. He hoped the local authorities would consider the question, and if they did he was confident that they would have better preventive measures than at the present moment.

Dr. C. P. Lapage (Physician, Manchester Children's Hospital): It was as a hospital physician chiefly concerned with the means of detection of tuberculosis in children that he wished to speak. They had had a great deal of evidence that day with regard to the frequency of tuberculosis in children, and some school medical officers seemed to doubt whether the statistics shown by the cutaneous reaction were really reliable. He claimed that tuberculosis in children was usually, or very often, entirely limited to the glands, the lymphatic glands of the thorax or the abdomen, and was consequently not diagnosable by ordinary physical examination. He had formed this opinion partly from pathological evidence in examining the records of the children who had died at the Children's Hospital in the last five or six years. These records showed that in many cases tuberculosis in children of about school age was almost entirely limited to the glands, or at any rate limited to regions which were inaccessible to the ordinary physical methods of examination. The X rays were also a very valuable means of examination, lesions in the lungs being visible by this means when there were no signs visible under the ordinary methods of examination. For that reason he should advocate the provision of X-ray installations whenever possible, *i.e.* whenever expense would allow it.

The only other point which he should like to emphasise was in reference to what Dr. Telford said as to there not being sufficient hospital provision for surgical tuberculosis. He was quite sure that the same thing applied to medical tuberculosis. They were in urgent need of further provision for tuberculous children, because they were infected, and if left to return to their usual environment would develop more active tuberculosis; whereas if these children were taken in hand and treated continuously—removed from their homes and not sent back to the same environment, a great deal of the disease could be stamped out.

Miss McGaw: They had heard that day that tuberculosis of the child means tuberculosis in the adult. Therefore, the importance of dealing with it in the child, both from the preventive and the curative side, was obvious. Open-air schools were one of the most popular methods of dealing with the children to-day, but there were one or two things which one would like to see in them. One was the provision for permanent open-air conditions, for it was almost useless to send children merely for a short time to an open-air school. It was an absolute necessity, if the child was to grow into a healthy citizen, to put him for the whole of his school life, she might say, under proper open-air conditions. One would like to see all the schools built after the pattern of the school which Mrs. Leslie Mackenzie showed them. But that was hardly possible. At the Tuberculosis Congress in Rome a gentleman from Berlin showed some charts of open-air schools, which were open from May to October. The charts proved that while the weights of the children increased during the term, they fell off during the period when the schools were closed. These charts covered a period of some five years, and the net result was that at the end of the five years the child had increased but little in weight because of the fall while the schools were closed. The second point she would like to make was that schools for tuberculous children should be linked either to a dispensary or to a sanatorium. In either case one would like to see the children selected by the dispensary, and if they needed residential treatment, passed through a sanatorium school—a residential school—just as an adult would pass through the sanatorium. If a day-school were sufficient let them pass to a day-school under the care of a dispensary. The reason was that if the children were selected by the dispensary medical officer they were, generally speaking, found in homes where there were adults who were tuberculous. At least that was fairly often the case. The doctor of the dispensary had charge of the child in the school, and possibly the parents or brothers and sisters in the home, so that there was no conflict of medical opinion. If the homes were under the care of the dispensary the home conditions were improved. The child was probably allowed to sleep in a single bed under an open window. The parents were taught about cleanliness, and by the dispensary visitors about the necessity for rest, which was a thing that poor people understood very little. They were also taught as to food. They were also taught about clothing—sometimes that the children needed warm clothing, but very often that they wore too much. There were three schools in existence worked in this way linked to dispensaries and sanatoria. The first and the oldest was the school which Mrs. Leslie Mackenzie had described, in connection with the Royal Victoria Hospital, Edinburgh. That was partly a residential and partly a day-school. There were two schools in London, one entirely voluntary, which Dr. Squire mentioned, started by the St. Marylebone Dispensary for the Prevention of Consumption, and working in Regent's Park. The third, the one in Paddington, was partly run by the County Council, the teaching staff being paid by them. She mentioned these three schools, not because they were the only open-air schools, but because they were three which were part of a co-ordinated scheme, and they were permanent. They were never shut. In the case of the Paddington school, which was a council school, they had a holiday school to fill up the gaps between the Council's work, and only last week they decided to open it on Saturdays.

Dr. Edwin H. T. Nash (M.O.H., Wimbledon) : Some speakers seemed to think that the open-air school was a nebulous thing one was to see in the dim and distant future. But if they looked at the report of the committee under the National Insurance Act they would see that the open-air school was one of the special items to form a link in the chain. He would like to point out that the position was not anything like what was imagined. In establishing an open-air school you first received, under the Insurance Act, instead of the thirty shillings grant per child for ordinary education, a special grant of four pounds a year per child. Further, Mr. Hayes Fisher had recently in the House of Commons asked a question, to which Mr. Trevelyan replied that it was hoped to pay 50 per cent. of all money spent on treatment before July this year. And that payment he understood would go on from year to year. This meant that if they certified the children in an open-air school for tuberculosis and for pre-tuberculous treatment, 50 per cent. of what was spent on the open-air staff would be refunded by the Treasury. That would put the whole matter on an entirely different footing. In addition to these two grants they would also get a substantial grant as sanatorium benefit under the National Insurance Act, so that the whole idea of open-air schools was entirely different from what it was even six weeks ago. He commended this to representatives of municipalities because there was no doubt that the open-air school was to be one of the strongest weapons they had in the fight against tuberculosis. As to Mrs. Mackenzie's point about instructing their school architects, he felt as a school medical officer that this was one of the very serious items. His experience was that the architects did not consult the school medical officer, who was the person who knew most about it. And he would warn municipal representatives not to go into that abomination, the competitive plan, which simply meant that the architect put up a beautiful exterior full of all sorts of abominations in the way of artistic atrocities, the municipal representative quite overlooking the points essential to the child's welfare. It should be an essential principle when they were building schools to consult the medical officer. As showing the trend of affairs, he might say that an effort was sometimes made to reduce, on the ground of expense, the play-ground area of the schools. They did not want that. They wanted as much air as possible round the schools, and they should not diminish the 40 ft. as far as the children were concerned.

Another question was that of school cleaning. If some of them who were interested in schools would watch the school caretakers cleaning the schools, they would be surprised. This, again, was a matter of money. Then about the power of resistance to tuberculosis and the question of feeding. There was one point which all the speakers had left out in dealing with the tuberculosis problem among the working class. That was the Poor Law system. Until they absolutely revolutionised the Poor Law system they could not deal with the problem adequately. He would quote a case typical of hundreds of cases occurring daily. A woman whose husband had died brought two children to him to be examined. There were six in the family. He went into the question of the woman's means. The guardians were allowing that woman twelve shillings per week to keep herself and family, and to ward off the infection which had undoubtedly taken place. Out of that she had to pay her rent. Would they tell him how it could be done? The majority of cases of malnutrition occurred, not amongst the "wasters" or ne'er-do-wells, but among the decent, honest, striving poor. They came on hard times and would have nothing whatever to do with the Poor Law as at present administered. These were the cases that they wanted to deal with. If they wanted to do anything in the fight against consumption they must deal with the Poor Law system and revolutionise it, so that the relief should be on a much more generous and open-handed scale than in the past.

Dr. CECIL WALL (London): His impressions—and some of them he knew as facts before—were firstly, that tuberculous foci were extremely common—practically present in 90 per cent. of the children; secondly, that though these foci were so extremely frequent, yet all children did not suffer from tuberculosis. But if at any time the vitality of the individual who had that tuberculous focus was lowered, then the disease would spread and the patient would begin to suffer from tuberculosis. His next impression was one in which every doctor would agree with him, that the diagnosis of pulmonary tuberculosis was almost always difficult, especially in the earlier stages; that, in fact, the diagnosis of pulmonary tuberculosis was one of the most difficult problems we had to face.

The next impression he had received was that the chief, if not the sole, means of dealing with declared tuberculosis was an effort to raise the general resisting power of the body. And the means which they had for raising that resisting power were represented by what was frequently termed "the triad of treatment," rest, fresh air, and nourishing food. Fresh air and food had already been touched upon. Dr. Telford told them something about the value of rest in the treatment of surgical tuberculosis. That meeting was not concerned particularly with the treatment of pulmonary tuberculosis, but he should like to urge the importance of rest in the treatment, at all events of the active stages of pulmonary tuberculosis. Tuberculosis of the lungs did not differ from tuberculosis of the knee-joint. When the disease was active there had to be physical rest.

These were some of his impressions. As to the questions he wanted to ask—they had heard of the great value of the open-air school in the treatment of tuberculous children, and children suspected to be so suffering. But he wanted to ask why they should wait for suspicions of pulmonary tuberculosis and other forms of the disease to arise. The treatment they prescribed after they suspected tuberculosis was that of raising the general health of the children. Why should not that treatment be applied to all children? Why should not all schools be open-air, and why should the tuberculous child be placed at an advantage over the non-tuberculous child?

Dr. H. de Carle Woodcock (Leeds): Resistance to disease was intermittent—sometimes great and sometimes very slight indeed. It was said during the afternoon that children after operation, say removal of tonsils, should be kept away from other children for a time because their power of resistance was low. The same applied to any illness amongst children. After any acute illness it should be a considerable time before the children were allowed to mix with other children and thereby perhaps receive infection.

The words "pre-tubercular" stage had been used. He did not believe in the "pre-tuberculous" child. A child was either tuberculous or non-tuberculous. Dr. Squire in his remarks spoke about the "pre-tuberculous" stage, or the stage of children who were not clinically tuberculous. Examining 300 or 400 children the speaker had found signs of tuberculosis in 25 per cent. He agreed with Dr. Philip, who found tuberculosis in 30 or 40 per cent. But what was to happen to these children? Using the tuberculin test he found that these "Philippian" children all re-acted to the test, *i. e.* they had tuberculosis. Then he came to another set of people. In the hospital of which he had part charge he found there were a great number of adolescents who died very rapidly when they took infection. They had not these "Philippian" signs; they had not the signs he found in the children in the schools which were admittedly signs of tuberculosis. This meant that infection was warded off from these children.

Therefore he thought there were great dangers in adult and adolescent life. And if all the legislation was built up on the idea that infection was only received in childhood and that those who had escaped in childhood had escaped altogether, a great mistake would have been made.

FORENOON SESSION, JUNE 6th.

TUBERCULOSIS IN CHILDHOOD—*continued.*

Dr. Leslie Mackenzie presided at the opening of this Session.

The Lord Mayor of Manchester (Mr. S. W. Royse) was present to welcome the Conference to the City.

The Lord Mayor said: I am sorry I was not able to be here yesterday morning, but your meeting was at the time of the meeting of the Council. I am none the less pleased to be here this morning. The work you have in hand is an admirable work, so much so that I cannot call to mind anything that is going forward at the present time in this country of greater or of as great importance. It seems to me that we have to consider this matter not alone from the way it affects the people of this district, but from the way it affects the whole of the inhabitants of the country. I am informed—rightly or wrongly—that there are something like 250,000 people affected with tuberculosis in this country. If this is so then I am afraid that the sum of £1,500,000 which has been allocated by the Government for the purpose of treating this dreadful scourge is very inadequate. It is quite true, however, that we must make a commencement, and let us hope that the money will be wisely spent and that it may do great service. I think you will admit that, so far as Manchester is concerned, we have done something here—(Hear, hear)—in order to alleviate and prevent tuberculosis, and especially tuberculosis in children. Many of you in this room, if not most of you, know that we have for something like twenty years been combating this dreadful malady. You are aware that in the Royal Infirmary we have done very good service, and not only there but in many other institutions in and around Manchester. I may especially mention the Delamere Sanatorium, built through the munificence of Sir

Wm. Crossley. That has done very good service, but there are also other institutions in Manchester which have come forward and given very great help. Notably I may mention the work that has been done by the Guardians. When we take the work that has been done by them and by the various institutions, I think you will agree that there is a great deal to the credit of the city in this matter. I do not wish to infer by that that other cities have not done their share, but I am naturally reviewing more the work that has been done in Manchester and the surrounding district. I notice the title of your Association is The National Association for the "Prevention" of Consumption, though, as Dr. Niven pointed out, this meeting is chiefly concerned with the question of tuberculosis in children. I am informed that the deaths of children under five years of age are very large indeed, clearly showing, to my mind, that it is the question of milk that requires to be considered. If milk is used it ought to be treated in some way. We are very largely indebted to Professor Delépine for the research work he has carried out in connection with this question. (Applause.) I think he demonstrates quite clearly that if you have a cow suffering from tuberculosis a certain quantity of these infectious germs will get into the milk. And, as we all know, the milk of one cow is not kept separate from another, and although there may be only a few cows at a farm affected, their milk will get mixed with that of others. In this direction the research work of Professor Delépine has certainly the commendation of this meeting. If he never did anything more he has contributed for the benefit of the community a great amount of material to the consideration of this subject.

There is another aspect of this matter, though I do not know that you will be quite in sympathy with my views. When we remember that we have something like 20,000 general practitioners and only a few dozen medical officers of health, it is quite clear that we must largely rely upon the help of the general practitioners. Further, to my thinking, the general practitioners, from the very nature of their occupation, coming in contact as they do with all classes, and obtaining the history of their various patients, can probably know more in regard to the family history of tuberculosis than any medical officer can possibly be expected to know. I therefore think it is desirable for this Association and those who are studying this disease that they should work in co-operation with the general practitioners for the general good of the community.

Another matter I would like to draw attention to is the question whether it necessarily follows that we must always send tuberculous patients to a sanatorium. I do not know if this is really necessary. In severe cases, of course, it becomes necessary, but I am speaking of the great majority of cases where people are perhaps only slightly affected. Where this is so, is it not possible for science, and for the practitioners and those who have studied the question—is it not possible for them to find some method of treatment at the outset in some less expensive form than that of sending cases to a sanatorium? (Hear, hear.) It is not for me to suggest what can be done, but every case that goes to a sanatorium means a very large expenditure, and if there are 250,000 consumptive people in this country at the present time, you will find that £1,500,000 will only work out quite insufficiently at £100 per bed.

Let us in all these matters be practical. In other words, let us see the end of our operations before we commence. In that way we shall probably do more good than if we proceed treating one here and one there, and not getting the advantage that would accrue from a clear, well-conceived, well-thought-out method of tackling this great scourge.

In concluding, I think I may say that I am sure there is no medical man in the United Kingdom more worthy of support and help than Dr. Niven, of the City of Manchester. (Applause.) We are exceedingly proud of him in Manchester for the work he has done. It is, however, mainly by meetings of this kind, by consulting and talking over the various problems, that we can arrive at anything like satisfactory conclusions. (Applause.)

On the motion of the Chairman a hearty vote of thanks was passed to the Lord Mayor, who acknowledged.

OPEN-AIR SCHOOLS.

By Mrs. M. D. POWER SWEENEY, M.A.Lond.

I have been invited to read this paper, and though very diffident as a simple "layman" among the doctors, yet my knowledge of open-air schools both here and abroad, from the teacher's point of view at any rate, may justify me in relating my experiences even if I do not come as a prophetess.

My husband was assistant at the first open-air school started in England in 1907, viz. the London County Council School at Bostall Woods, near Woolwich. So great was my interest in the experiment that the same summer I visited no less than three German open-air schools, viz. Charlottenburg, Elberfeld and München-Gladbach. The success of the first London school having been deemed satisfactory even after so short a duration as three months, the year 1908 saw the experiment extended to no less than three schools, two south of the Thames, viz. at Shooter's Hill and Forest Hill, and one north of the Thames, viz. Kentish Town. My husband was appointed head master of the last, and I his head assistant, with charge of the catering department which in the foreign schools is always in the hands of the school nurse. It is of this school I shall speak in detail later, as we passed the summer of the subsequent year also there. Meanwhile we had spent our belated "summer holidays," viz. December, in visiting the Charlottenburg *Waldschule*, the only one of the kind open at that period of the year, and we were privileged to celebrate Christmas in German style amidst forest surroundings and in the open air, and to be present at the closure of the school on December 23rd.

The London County Council having failed to secure the accommodation at Montpelier House, Kentish Town, for a prolonged period, the summer of 1910 saw the site in the hands of the builder, and no other suitable site having been found, the one North London school was allowed to lapse, and since then only the two others have been maintained. Obviously in addition to difficulties of site there is the very grave question of expense, and when one considers that the gross cost per head per year amounted to £24 11*s.* 8*d.* as against £6 11*s.* 4*d.* in the ordinary school, one cannot be surprised at educational authorities adopting the system of open-air schools, though admirable in itself, somewhat slowly.

Speaking from personal experience I learnt so much in the two summers of what might be done with very poor material indeed, given fresh air, rest, wholesome food and even a minimum of personal hygiene, that I felt much more might be done with the normal school-child by open-air conditions, combined with rest, good food and cleanliness as the child's usual home circumstances. It is rather as a prophylactic measure, therefore, that I would urge the claims of the outdoor school. In my own school, which I dare not label as an "open-air school," for fear of frightening people, we nevertheless do enjoy an open-air life to the utmost extent during the summer and early autumn. Formal instruction with pen and ink is given indoors, but oral work, hand work, elocution and drill, breathing exercises and Morris dancing lend themselves admirably for open-air tuition, as do language lessons, history, literature and nature study *par excellence.*

And though I neither feed nor bathe the children, nor submit them to medical examination, for the parent who pays for his child's education at a private school would deem such things the grossest interference, yet if increased attendance and greater immunity from colds during the subsequent winter months count for anything, then I say open-air classes and open-air methods are worth something. The proverbial and much-maligned schoolboy, that "creeps unwillingly to school," does not do this because he hates lessons. Let him occasionally enjoy the pleasant sensation of escape from the four walls of the classroom and taste of that greater freedom which can, and should be, granted outdoors. Children under these conditions reveal themselves much more; the teacher gets into closer touch with them as they do with nature. The trees, plants, etc., in the school garden are not merely observed as in the ordinary botany lesson, but their life-history is followed throughout the year, from the resting bud to the ripening of the fruit. And if a language lesson be interrupted to watch a thrush feeding her young, or a bee sucking honey, the supposed loss is in reality a gain in the added interest in that most wonderful of all studies—life.

But I must pass on to the real object of my paper, the genuine open air, or, as the Germans put it, the *forest* school, and this feature, as far as I have been able to observe, is the *sine quâ non* of any German school specially designed for physically weak children under medical observation.

Medical inspection of school-children has been in existence in Germany for some fifteen years. About ten years ago the attention of both medical and educational authorities was concentrated on a certain class of children, some 3 to 5 per cent. of the whole who, though able to attend school, failed to profit by their instruction owing to their suffering from incipient stages of anæmia and many other diseases. To quote from the Charlottenburg authority: "The condition of these children demands that they shall not be retained in the elementary school. For them the air of the class-room in which fifty or more pupils have spent almost continuously the whole morning is especially injurious, the recreation periods too brief, and the demand on their attention during lessons lasting from four to five hours daily too great for them to benefit. These are children suffering from lung and heart affections, anæmia and scrofula; they are not, however, ill enough to be received into a hospital, but are nevertheless too weak physically to keep pace with their class-mates. The retention of such children in crowded class-rooms gravely enhances the risk that the slight affection from which they suffer will be aggravated into a severe form. To separate such children and teach them in the open air is as much a matter of interest for the remaining scholars and the parents of the sufferers as for the children themselves."

Germany has for years possessed *Walderholungsstätten*, where patients who live at their own homes can spend the whole day for a period of some weeks in the air of pine woods, resting, receiving good food and returning home at night. The same system is possible for children, but of course they are thereby losing valuable time from the scholastic point of view. The city of Charlottenburg then planned a school sanatorium. Apart from the great expense thus involved there is also the question of entirely separating the pupils from their own homes, highly advisable in certain instances, but on the whole to be deprecated. A compromise was found in the idea of a *school for physically weak children,* just as provision had already been made for mentally and physically defective pupils.

It was not till 1904, however, that the plan was carried out. An admirable site of some seven acres was obtained in Grunewald, within walking distance of west-end Charlottenburg and which might be easily reached by electric tram. The site was undulating, well-drained, richly covered with lofty pines which admitted plentiful sunlight—such an important factor—and with various shrubs, which lend an especial charm to the wood and, above all, there was the glorious pure air free from dust. The *Väterlandisches Frauenverein,* or National Women's Union, undertook the domestic side of the undertaking at cost price, and further provided gratis a Doecker building of light construction, thus saving expense to the extent of £225. The city provided a sum of £1600 for initial and current expenses. One school building was provided, made of pulp and wood, containing two class-rooms, 18 by 24 ft., and two teachers' rooms 9 ft. square. Windows up to the roof extend along one side, and further ventilation is provided in the roof and the other long side. To avoid draught the doors open on to a little corridor.

The question of furnishing these rooms was important, as in bad weather the class-rooms had to be used for meals and play. Portable tables and wooden chairs of varying heights were therefore adopted. At the back of the building are lightly constructed and well-ventilated cloak-rooms, one for boys and one for girls, in which each child was provided with a peg and also a shelf for the rug. The greatest care is exercised in restricting the use of articles to individual children and in keeping such articles apart as far as feasible. Even the milk mugs are numbered and hung on numbered pegs.

At some distance from the school building is a large hall with a wooden floor, three wooden sides and a roof. The south side is left entirely free. This *Liegehalle* is used for the compulsory afternoon two hours' rest and sleep in wet weather.

I must be pardoned if I detail at some length the domestic economy arrangements at Charlottenburg, for as far as my knowledge extends nothing similar has been attempted. The München Gladbach and Elberfeld Schools are fortunate in getting all their meals cooked and served by the adjoining "Walderholungstätte," and thus have only to face the cost of providing and serving the meals, and have had no outlay for plant. In the London schools such provision as was possible at the two houses was more or less satisfactorily adapted, and in the case of the third school a coal-hole was fitted up as a temporary kitchen!

The Charlottenburg domestic arrangements are conveniently concentrated in a one-storeyed Doecker building consisting of five rooms, one of the two larger affording a bed-sitting-room for the Red Cross nurse, who is in charge of the house-keeping, bathing, etc., and the carrying out of medical orders. It is also used for medical examination at the bi-weekly visit of the school doctor. The other large room is the kitchen, while the other three provide a store-room and bed-rooms for the servants. Adjoining the kitchen is an open scullery for washing up and the preparation of vegetables, etc., a wooden out-house serving as vegetable store, below which is a spacious milk cellar, so well constructed that in the greatest heat the milk never went sour. Coal and woodsheds are equally well planned. In fact, the whole arrangements are so admirable that the sister-in-charge was able to lay in stores of various articles at advantageous prices, and to keep her food bills down to the minimum allowed, without depriving the children at a time when prices had risen. In front of the kitchen rough tables and forms are provided primarily for meals, but are also used for the preparation of lessons, for owing to lack of accommodation only two classes could use the class-rooms at once. A roof was subsequently added in order that the children could shelter from the burning noon-day sun at dinner-time, and be equally protected from rain. At meals the children go in turn to a little window leading from the kitchen and fetch their own mugs and plates.

A special water supply was furnished gratis by the Charlottenburg waterworks. The kitchen and bath waste water are carried off to a pit and readily absorbed by the sandy soil. Close to the kitchen is a primitive washing shed, with a partition dividing the boys from the girls. Here enamel basins are arranged on a board.

Adjoining is the bath-room, fitted with an ordinary bath, a shower-bath, and six bathing cabins. The shower-bath is very largely used by all children unless medically forbidden, and an ordinary warm bath is given once a week.

The closets, located at some distance from any of the other buildings, are of the ordinary earth type, and have proved as satisfactory as can be expected.

Dotted throughout the grounds are little seats, tables with roofs in rustic style where the children can play or work or read at will. Gymnastic apparatus is also provided, and a portion of the ground is divided off as a garden.

A caretaker with a good watch-dog has also a small hut near by, where he sleeps at night.

The daily programme of a pupil of the open-air school, consists of instruction of a formal character reduced 50 per cent.—*e. g.* from four or five to two or two and a half hours per day. Such instruction is given only in the main subjects or mother tongue, arithmetic, Scripture, geography, and history. Children who could not arrive on foot meet their teachers at certain points in Charlottenburg, and came out by reserved electric car, arriving at 7.45 a.m. at the school, when the "first breakfast" is served. This consists usually of a mug of soup and a slice of bread and butter. At 8 o'clock lessons begin, lasting only half-an-hour each, with a break of five minutes at the end of each half hour, and of ten at the end of each hour. At 10 a.m. the second breakfast, or, as we should call it, lunch, is served, consisting of one or two mugs of milk; on an average half a pint per head is allowed, and a slice of bread and jam. Work goes on again for other classes from 10.20 to 12.20, while the rest play in the forest.

Toilet preparations having been made all are ready at 12.30 for the mid-day meal, consisting of meat, potatoes, and some other form of vegetable, the allowance being approximately 3½ oz. of the former and 7 oz. of the latter per head, although, of course, the food was not in any sense measured out, but supplied according to the appetite of the children, who were encouraged to ask for more. In some cases children had to be coaxed to take even the minimum. The food is good, nourishing, and appetisingly prepared, and practically none of the parents of the pupils could provide such meals, the cost of which was defrayed to some slight extent by parents' contributions, which were levied in proportion to the family income. The weekly payments were made in advance. A good number receive free meals.

After dinner the children fetch rugs and deck-chairs, and under supervision of the teacher settle down for two hours' sleep and rest. Many children at first found great difficulty in sleeping thus at mid-day, but gradually accustomed themselves to it. At 3 p.m. other classes assemble for lessons till 5, with a break at 4 for the afternoon milk and piece of rye bread and butter or marmalade. At 6.45 the last meal is served, consisting of porridge, soup, or pudding, with rye bread and butter.

The sister-in-charge is allowed 6*d.* per day for the children and 1*s.* for the adults.

From the teacher's point of view the experience is full of intense interest, but no "duty-shy" teacher should take up the work, which is full of difficulties and involves a very great deal of self-sacrifice. In Charlottenburg, owing to the large area used, there must always be a teacher on duty apart from the actual instruction, and this during an eleven-hour day. Again, there are six school days per week of such length. Owing to the importance for the children of the systematic feeding, etc., no single day may be lost to them, so Sundays and holidays alike have to be spent in the school. This entails at least half the members of the staff spending Sundays at the Waldschule, while their summer holidays were likewise reduced by one half. In consideration for all this extra time they receive their meals and an addition of £2 10*s.* per month. They must, however, be ready for incidental instruction at any moment, and, indeed, the children can often only catch up lost ground by the individual teaching and help given out of school. Again, the teachers must be full of resource and able to devise bad weather occupations or to organise games. Infinite patience and great love for children alone can help the teacher, for mere conscientiousness will not suffice. The children when they first come to the school are a heterogeneous assembly, which it is very difficult to classify even under the nomenclature of the ordinary schools. Again, many of the children have already lost weeks or months of attendance at their own schools through ill-health, and are on that account below standard. Again, the actual time of teaching is reduced to a minimum, but this involved a brisk and rapid treatment of only the essential parts of the subject and an attempt to cover the year's work, so that the pupil should be able to take his right place on returning to the ordinary school.

The work of the school doctor in regard to the Waldschule consists first in the selection of the children from the elementary schools, and then in constantly watching their progress during their stay there. The sister-in-charge has to weigh the children every fortnight, and at stated periods to measure their height, lung capacity, and, in some cases, to test the hæmoglobin in the blood, according to Tallquist's method.

It is interesting to note that no actual medical treatment is given, but that the doctor's orders are purely hygienic, viz. with regard to clothing, the limiting of exercise in heart cases, the prescription of certain baths for scrofulous children. The following is a rough calculation of the results of the first experiment of three months' duration, made by Dr. Bendix, the physician attached to the Waldschule. Far better results have, I believe, been obtained in subsequent years, but I am not in possession of the figures.

Results, 1904.

1. *Anæmia.*

34 children (23 girls and 11 boys).
1 grew worse : 2·9 per cent.
9 were unchanged : 26·3 per cent.
11 improved : 32·4 per cent.
13 were cured : 38·2 per cent.

2. *Scrofula.*

38 children (18 girls and 20 boys).
0 grew worse : 0 per cent.
8 were unchanged : 21 per cent.
22 improved : 57·9 per cent.
8 were cured : 21·1 per cent.

3. *Heart affections.*

14 children (9 girls and 5 boys).
0 grew worse : 0 per cent.
7 were unchanged : 50 per cent.
7 improved : 50 per cent.
0 were cured : 0 per cent.

4. *Lung affections.*

21 children (8 girls and 13 boys).
1 grew worse : 4·8 per cent.
8 were unchanged : 38·1 per cent.
8 improved : 38·1 per cent.
4 were cured : 19 per cent.

An important feature of the experiment was the interest taken by the parents, who in many instances were, originally at least, dubious or distrustful. They were allowed to visit the children in the school on Sunday afternoons. They were thus brought into closer touch with the teachers and their co-operation secured. This is essential to all true education, but it is of paramount importance when the hygienic principles of the Waldschule need so much to be carried into the home in order that most of the good gained may not be lost through subsequent neglect.

When I visited the Charlottenburg school first it had already been three years in existence, and I saw it under glorious weather conditions. It was with a certain amount of curiosity that I returned to it in December some sixteen months later.

As I am so limited to time I had better draw attention to the winter conditions of work there, as I consider the London schools very inadequately equipped for such at present.

At Charlottenburg the number of the children had been very considerably reduced, only the worst cases being retained. The class-rooms were heated by stoves kept going day and night. Only two meals were taken outdoors, namely lunch and the afternoon milk, and these were enjoyed by the children whilst moving about, it being far too cold to sit still. The children wore thick capes with hoods. Owing to the early darkness supper was not served, the children leaving immediately after the afternoon meal. The time-table was likewise modified to enable the children to play outdoors for half an hour after each half hour's instruction. During that period the rooms were carefully ventilated. The afternoon sleep was still taken out of doors, each child being provided with three blankets, as well as the aforementioned cape. Very few desired, or were permitted, to sleep in the *Liegehalle.* On the last Sunday the school was opened we witnessed a very pretty little performance given by the children to their parents, and were also present at the Christmas tree and carol-singing in the open air of a chilly 23rd of December. The children all received presents and many recited. It was with genuine and evident regret that the children bade good-bye to the teachers with whom they had spent so many happy months, and doubtless the prospect of return to their own school, where they would be units lost among so many, was not very attractive.

I have, no time to speak of the schools at München Gladbach and Elberfeld, which are modelled on the Charlottenburg pattern, and which are both most delightfully situated, the latter in hilly country reached by the railway. I must now speak of the London schools. I regret I know nothing about the open-air schools at Bradford and Halifax.

The London County Council Open-air School at Montpelier House, Brecknock Road, Upper Holloway, was opened on June 10th, 1908, and closed on October 31st, 1908.

Site.—The school site consisted of a house, for several years untenanted, with about two and a half acres of surrounding grounds. The latter, very much neglected, comprised (*a*) a space in the front and at the side of the house which we converted into a garden; (*b*) a larger space at the back in which the instruction was given and games played; and (*c*) the third and smallest portion containing the shed in which meals were served. This last division was frequently muddy and almost impassable in wet weather. On the whole, however, the site was fairly satisfactory, and, though damper than its elevated position would lead one to suppose, it possessed the important advantages of being a secluded and quiet open space in a somewhat crowded district and also of being easy of access for all the children. The grounds were also well wooded with a plentiful variety of trees and shrubs and climbing plants, thus affording a splendid opportunity for nature study, which was adequately utilised.

Children.—The children, ninety in number, were selected by two of the Council's doctors, one a lady doctor, from twenty of the surrounding schools. Most of these children were suffering from anæmia or malnutrition, the result almost invariably of neglect and improper or insufficient feeding. There were also a few cases of weak hearts, and a couple of children with incipient phthisis or other lung trouble. A large proportion had bad or imperfect teeth needing attention or treatment; 14 per cent. wore glasses, and about 10 per cent. stammered or suffered from some other form of defective speech. The ages of the children ranged from seven to fourteen years, and they had all been in actual attendance at the ordinary Council Elementary Schools; no others were eligible for admission to the Open-air School. These children were not mentally defective. Their intellectual backwardness, where it existed, was due either to their physical weakness, often necessarily resulting in irregular attendance, or to the fact that they had been attending a very large class in their previous school—containing sometimes as many as sixty pupils. The classes in the Open-air School were mixed, and comprised in each form or class about an equal number of boys and girls, the maximum on roll being 25.

Home conditions.—A good idea of the parents' circumstances, and therefore, to some extent, the home conditions of the children, may be obtained from their rate of contribution to the food expenses. Before the school opened the parents were informed that they would be expected to pay for, or contribute towards, the meals provided for their children at the school. A careful inquiry was made into the circumstances of each family, and a contribution varying from 2*s.* 6*d.* per week, the actual cost per head of food, to 6*d.* was fixed. Six out of the 82 pupils paid regularly every week this full amount (2*s.* 6*d.*); 31 paid regularly and 34 irregularly a weekly reduced fee, while 9 paid nothing whatever. The total sum received from the parents during the whole term amounted to £80 11*s.* 1*d.*, being about two fifths of the actual cost of food supplied.

Staff.—The staff consisted of eight persons, viz. a head master, an assistant master and two assistant mistresses, a nurse, a caretaker, a cook and cook's assistant. One of the Council's doctors, who visited the school every week, was intrusted with the duty of looking after the physical condition and welfare of the children.

Aims and ideals.—Such, then, being the site of the school, the children and staff of which it was composed, our next step will be to inquire what were the aims and ideals which it set forth to accomplish, and to what extent, if any, these have been realised.

Time-table analysis.—A copy of the school time-table is appended, but the analysis given below may be appropriately inserted here. The children attended for ten hours each week-day except Saturday, when they attended six and a half hours, from June 10th to the end of September, viz. from 9 a.m. to 7 p.m. During the month of October the school closed somewhat earlier, about 6 p.m., and finally 5 p.m. On Saturdays the children were obliged to remain for sleep till 3.30 p.m., after which a further attendance for games and sports was optional; quite a number remained till 7 p.m., though no tea was provided; cake, bread and butter and milk were, however, generally given. The following was the total time spent per week in the school as apportioned in the time-table:

	Minutes.
Meals	720
Sleep and rest	720
Organised games	450
Manual training, viz. wood-work, cane-weaving, bast-work, basket-work, brush-work, clay modelling, needle-work, laundry-work and gardening	255
Arithmetic (practical, mental and formal)	180
Reading and literature	170
Singing	120
Composition	90
Art	90
Geography	90
Recreation	90
Nature study	80

	Minutes.
History	80
Drill and breathing exercises	75
Scripture	60
Moral instruction and civics	60
Hygiene	60
	3390 min. (or 56 hours)

From this it will be seen that the teachers were on duty for about ten hours per day. Omitting the time given to meals, sleep, organised games and recreation, the remainder of the time devoted wholly to instruction amounted to about twenty-four hours per week of four hours a day.

Cleanliness and fresh air.—Undoubtedly the physical improvement of the pupils, their complete restoration to health, the development, as far as possible, of thoroughly efficient and capable organisms was to be one of the fundamental aims and objects of the school. The means by which this end was to be attained were various. The children were to be kept in the open air as much as possible, suitable provision being made for inclement weather and variations in temperature. All teaching was to be done out of doors, except when impossible or impracticable. Scrupulous cleanliness was from the first to be rigorously enforced. Hands, nails, teeth, heads, ears and bodies were to be frequently and regularly inspected and thoroughly cleansed.

Bathing.—Each child received two hot baths every week. The bathing arrangements, though somewhat primitive, were none the less effective. A basement wash-house having a copper quickly heated, well supplied with water, a flagged floor with several drains, these, together with half a dozen saucer baths, plenty of soap and the supervision of the caretaker provided all that was needed. A capital shower-bath was obtained from an old watering-can discovered on the premises. Such an arrangement as this, as well as many other examples, though lacking, perhaps, in the elements of "show" and "finish," taught the children in a very practical manner two very important lessons, viz. (1) how to make the best use of the materials to hand, and (2) how little, in most instances, good and important results depend upon elaborate apparatus.

Food.—The dietary also was a matter of very great importance. To provide a thoroughly nutritious and varied diet at a low cost (2*s.* 6*d.* per head per week being allowed for seventeen meals) was a matter, at first, of no small difficulty. Profiting by the experience gained by the recent municipal feeding experiments at Bradford and Birmingham a thoroughly satisfactory menu was provided at an average cost of 2*s.* 4*d.* per head for children, staff 3*s.* 6*d.* The accompanying menu (see Appendix) is a fair example of an ordinary week's meals at the Montpelier House Open-air School.

Physical exercises, games, and dancing.—Drill, breathing exercises, free recreation, and organised games may be described as an essential element in the proper physical development of children. Each form of exercises has its distinctive educational as well as physical value, and none was neglected or overlooked in our time-table. In this regard I may mention that especial thanks are due to the assistants and nurse, whose self-sacrifice and whole-hearted interest in their work was evinced by the energy and success with which they led or joined in the games and sports of their pupils. Morris dancing formed an important and frequent alternative to organised games. It constituted a great source of delight and happiness to the children.

Sleep and rest.—A special and peculiar feature of the Open-air School is the two hours' rest indicated on the time-table. From 1.30 to 3.30 each week-day (Saturday included) each child rested or slept. The majority on each occasion slept, and, of course, rested as well. Those who did not, or could not, sleep were obliged to lie perfectly still and get as much rest as possible. That the children greatly benefited by this repose cannot for a moment be doubted. By this means their over-abundant or exuberant energies were disciplined, controlled, and economised. They awoke re-invigorated and refreshed, and thoroughly capable of enjoying the lighter studies, manual work, gardening and games which constituted their afternoon occupations. Each child had his or her own rug, laying it on the ground when dry, fourfold thick. When the ground happened to be damp the children wrapped themselves in their rugs and lay as comfortably as they could on their deck-chairs. "What do you do when it rains?" was a question which never failed to be uttered with the same interest and curiosity by each successive visitor. Well, of course, we get under cover as expeditiously as possible. If rain came during the lessons we retreated to the class-rooms, and if during sleep-time, the children slept on their rugs on the floor of the Doecker shed, and one class-room in addition if necessary.

Interesting observations have been taken from time to time of the sleeping habits of the pupils. A close connection, it has been remarked, existed between atmospheric conditions and the "fidgetiness" or lack of concentration of the children at sleep, games, and during study.

Of the many evils which result from the overcrowded dwellings and artificial lives lived by the denizens of our cities and towns, one of the most prevalent, and, indeed, one of the most dangerous, in its consequences is the insufficient sleep of the children. This subject has not hitherto received the attention which it deserves, and yet the carefully compiled statistics of Miss Ravenhill and other investigators show the absolute need for such. The promoters of the open-air schools can congratulate themselves upon having initiated in this as well as in many other respects also a much-needed, far-reaching and exceedingly beneficial reform.

Medical inspection and treatment.—The regular weekly and often more frequent attendance of the doctor together with the practical help of a trained and permanently attached nurse were of enormous importance to the school. Parents attended when requested and were fully advised as to what should be done and how to do it. Many children were thus enabled to be treated at hospital, and such ailments as adenoids, rhinitis, ringworm, chronic diarrhœa, nits, pediculosis and impetigo were in several instances absolutely cured. Provision for dental treatment seems, however, to have been overlooked—an omission which it is to be hoped will be remedied on future occasions.

Instruction in hygiene.—All the foregoing practical precautions in regard to health, cleanliness, etc., were supplemented by instruction during two half-hours per week in the laws of hygiene. On these occasions the importance of open windows, ventilated rooms, cleanliness in the home and person, treatment of the body in its sense-organs, parts, members and various functions, regularity of bodily habits, the relative nutritive values of different kinds of foods—all these were fully and convincingly impressed upon the children. We have reason also to believe that this instruction has benefited not merely the pupils alone, but also, through them, the parents as well.

Moral development.—The moral tone of the children upon the whole when they arrived at the school was distinctly low. This was noticeable to all the teachers. Lying, pilfering, bullying, carelessness of property and sometimes wanton or wilful damage were not infrequent evidences of this tendency. Happily here, as in other respects, a marked improvement was slowly but surely made. Numerous occasions were thus afforded for the imparting of normal instruction by the "incidental" method and these were fully utilised. I am convinced, however, that had not such instruction been supplemented by the regular and systematic treatment of the subject far less good would have been achieved. By the latter method the children's sense of right and wrong, hitherto blunted by acts of carelessness eventually growing into "bad habits," became keenly awakened; and the reasons being found for right actions these became more readily practised, more permanent, and much more intelligently performed. Lessons in civics were also given to the senior pupils.

Intellectual development.—That the children vastly benefited intellectually by their sojourn at the open-air school cannot for a moment be doubted. Every kind of educational development is not to be measured by "five sums right within a given time" standard. Criticised by this method the children might have been thought to have made little, if any, progress. Judged, however, by a higher, a broader, a truer conception of education, these very same children might be shown to have made considerable improvement. The transforming of dull, inert, sullen or apathetic children into smiling and happy boys and girls, kind and considerate to each other and to strangers; the changing of the listless lad to one full of interest, keen inquiry and aroused intelligence, the hundreds of ways by which, in an open-air school especially, the various activities of mind and body can be most healthily and at the same time most profitably employed, these are some of the elements of that true education which constitutes the basis of all future progress.

Nature study.—Nature study, needless to say, formed one of the most important and interesting subjects in our curriculum, and, although only two lessons of forty minutes each, in addition to two half-hour reading lessons on the subject, appear on the time-table, yet this does not by any means represent the full time devoted to it. The art lesson which followed was almost invariably a continuation of the nature-study lesson previously learned: it was the concrete expression by means of pencil, crayon and brush of the knowledge just acquired. Furthermore, nature notebooks were kept by the senior pupils, and in them were recorded daily observations of weather, wind, temperature, and other atmospheric phenomena. The real value of such lessons, however, consists more in the stimulative than the exhaustive qualities of their matter, and much was therefore left to the initiative and aroused curiosity which these lessons evoked in the pupils.

Practical teaching.—The main feature of all the teaching methods adopted in our open-air school was the utilisation to the fullest extent of the child's activities. Motion, life, action free and individual, within reasonable limits rather than dull and deadly passivity—this was the keynote of all our work. Wherever and whenever possible we eschewed the lifeless and often unintelligible text-book style. Arithmetic, when not purely mental, was mainly practical: trees were measured as to distances, circumferences, diameters, etc.; areas small and large were actually calculated. Weights and capacity measures were similarly treated, an additional and very real interest being given to the processes when, as was frequently the case, the day's food supply as to quantity and cost was being accurately estimated.

Geography and history.—Geography was treated in like manner with a like result; capes, bays, islands, rivers, lakes, canals, breakwaters, lighthouses, etc, made by the children's own hands in the ponds which they themselves had constructed, left a more vivid and intelligent impression than could be otherwise possible. The more advanced stages of commercial and political geography, as may be surmised, were by the same means taught with equal effectiveness. History was taught on similar lines, the utmost being made of the child's instinctive dramatic activities. Tableaux, miniature pageants, historical dramatic scenes and plays, all contributed to the teaching of history in the best possible way—to the juvenile mind at least.

Gardening.—Gardening was another very important feature in the work of the Open-air School. For the first time in their lives most of the children had the opportunity of cultivating plants and flowers. The eagerness and care with which this was done was, in many instances, pathetic; the materials were procured from every available source and the flowers were tended with the utmost solicitude. The skill evinced in the construction and painting of artistic garden rails to mark off each child's plot was by no means inconsiderable. The transformation of a waste piece of ground, which His Majesty's Inspector described on the opening day as an "utter wilderness," into a pretty garden well stocked with flowers and vegetables, was a splendid practical object-lesson on the benefits of co-operation, while individual emulation received its full exercise in the evident care and pride with which each separate plot was cultivated.

Literature, poetry, and songs.—The literature, poetry and songs taught in the school dealt almost entirely with country life and scenes. The immediate surroundings, though not quite rural, assisted to some extent the imagination of the children, and notwithstanding their many serious defects, the grounds of Montpelier House helped the children to realise, however dimly, something of that charm and peace of country life which, alas, comes so seldom, and when it does come, comes so late to the dwellers of our cities and towns.

CONCLUSION.

Time and space forbid me to quote statistics at any length, but figures can be found in the bibliography of both the German and English schools which amply justify the adoption of out-door schools.

The *physical results* of good and plentiful diet, baths, and a careful alternation of work and rest, and, above all, fresh air, have been in nearly all cases exceptionally good, and even subsequent tests after a protracted period of return to normal and generally bad home conditions have generally proved that if the children have lost much of the good gained, they are at any rate equal to, or not far below, the normal school child. Such cases as seem to be failures prove nothing against the out-door school; they only indicate that the open-air conditions need to be prolonged over a period of months or even years instead of weeks.

The *mental* results have been perhaps not so marked as the physical, for much of the intellectual gain to the child who has spent a few months in an open-air school cannot be measured by the "stereotyped" standard, but are to be found in qualities of observation and reasoning developed in intimate contact with nature, and under the constant and sympathetic guidance of the teachers rather out of than in school hours.

The replies of the head teachers of the contributory London schools after the experiment of 1908 as to the effect of the sojourn in the open-air school on the subsequent work of the child showed a very large percentage of improvement. (See Appendix E of L.C.C. report on open-air schools, 1908.)

The *moral* results. These are perhaps the most difficult to gauge, and will only show possibly in future years, but the children become in an open-air school members of a community in a very much closer sense than is possible in the ordinary school. The very fact that they are together for five meals in the day, rest together for two hours daily, have much more common leisure than under ordinary conditions, give increased opportunities for the practice of such virtues as forbearance, unselfishness, politeness, while the constant contact with teachers, who are in every sense the best friends of the children, has a very striking effect on all. Sullen children become bright under the combined influence of forest air, and the greater personal freedom accorded them during their long day in the open-air school; irritability gives way to cheerfulness, and the children are generally very willing to undertake communal duties in the spirit of true citizens.

The co-educational nature of the school has won praise from all teachers concerned. The mixture of boys and girls, of men and women teachers, but lends one more feature to the family character of the school. A dull boy is spurred on by the example of a bright intelligent girl, while the boys as a whole are better behaved when girls are present than otherwise.

"If," as Dr. Schaefer, Director of the Sanatorium and Physician to the Waldschule in München Gladbach, says, "we succeed by effective measures in fortifying only a certain proportion of the children who would perhaps be attacked in their best years by that fell disease consumption, or which has already taken root in them, then much ground would be gained in the battle against tuberculosis, a battle no longer confined to any one class of society. We believe we have found in the Waldschule a mighty weapon."

APPENDIX I.

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APPENDIX II.

MENUS.

Montpelier House Open-air School. Week ending September 26th, 1908.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
Breakfast.	Porridge and milk, sugar. *Staff.*—Ditto, tea, bread and butter, bacon.	Porridge and milk, sugar. *Staff.*—Ditto, tea, bread and butter, fried eggs on toast.	Porridge and milk, sugar. *Staff.*—Ditto, tea, bread and butter, fried bacon.	Porridge and milk, sugar. *Staff.*—Ditto, tea, bread and butter, dried haddock.	Porridge and milk, sugar. *Staff.*—Ditto, tea, bread and butter, boiled eggs.	Porridge and milk, sugar. *Staff.*—Ditto, tea, bread and butter, eggs and bacon.
Dinner.	Roast beef, Yorkshire pudding, potatoes, stewed rice and syrup. *Staff.*—Ditto, soup.	Boiled mutton, haricot beans, potatoes, stewed prunes and custard. *Staff.*—Ditto, soup.	Boiled cod and parsley sauce, boiled apple pudding. *Staff.*—Ditto, soup, prunes and custard.	Boiled beef, greens, potatoes, tapioca pudding. *Staff.*—Ditto, soup.	Lentil soup, bread, boiled currant roly-poly. *Staff.*—Ditto, steak, blancmange.	Mutton and barley stew, potatoes, semolina pudding. *Staff.*—Ditto, soup.
Tea.	Milk and water, bread and jam, bread and dripping. *Staff.*—Tea, bread and butter, bread and jam, toast.	Weak tea, bread and butter, cake. *Staff.*—Tea, bread and butter, cake, toast.	Milk and water, currant and white bread and butter. *Staff.*—Tea, bread and butter (currant and white), toast.	Chocolate, currant and white bread and butter. *Staff.*—Tea, currant and white bread and butter, toast.	Milk and water, white bread and butter, cake. *Staff.*—Tea, bread and butter, cake, toast.	No tea.

APPENDIX III.

TIME TABLE.—*Montpelier Open-air School, June to October*, 1908.

	9–9.30.	9.30–10.	10–10.45.	10.45–11.	11–11.40.	11.40–12.25.	12.25–12.45.	12.45–1.30	1.30–3.30.	3.30–3.45.	3.45–4.30.	4.30–5.	5–5.30.	5.30–6.45	6.45.
Monday.	Breakfast.	Scripture.	Arithmetic, mental and practical.	Recess.	Nature study.	Art.	Preparation for dinner (washing, attention to toilet).	Dinner.	Sleep.	Drill and breathing exercises.	Practical geography.	Reading.	Tea.	Organised games, gardening.	Prayers and dismissal.
Tuesday.		Moral instruction and civics.	Arithmetic, mental and formal.		History.	Singing.					Manual training.	Manual training.			
Wednesday.		Hygiene.	Composition.		Literature and reading.	Manual training					Practical geography.	Reading.			
Thursday.		Scripture.	Arithmetic, mental and practical.		Nature study.	Art.					Manual training.	Singing.			
Friday.		Moral instruction and civics.	Composition.		History.	Manual training.					Manual training.	Reading.			
Saturday.		Hygiene.	Arithmetic, mental and practical.		Literature and reading.	Singing.				Organised games (optional).					

THE RESULTS OF TREATMENT IN PULMONARY TUBERCULOSIS IN CHILDHOOD.

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Visiting Medical Officer, Millfield Home for Pulmonary Tuberculosis.

I HAVE the honour to represent the Metropolitan Asylums Board, who have a Home for Pulmonary Tuberculosis with 120 beds, called Millfield, on the south coast, near Littlehampton.

During the eight years that I have been the visiting medical officer—in fact since the Home was opened—I have had nearly 800 cases under constant observation.

Children between the age of three and sixteen are admitted; they are drawn mainly from the London Metropolitan area ; they are all under the jurisdiction of the various Boards of Guardians, and they are all sent down as suffering from pulmonary tuberculosis in the earlier stage.

I may mention incidentally that many of the cases that arrive are severe, showing evidence of the formation of cavities in their lungs and other gross lesions.

I have been asked to deal, however, with the question of prognosis and results, especially as affecting the earlier cases.

My first remarks will be an apparent digression from this main subject, but the continued observation of nearly 800 cases has left a very great impression on my mind, and if I put before you certain arguments, stripped of their technical detail, they will serve as an introduction to what I shall say later.

Years ago, when I was a student, I was taught that pulmonary tuberculosis did not exist in children except as an acute, rapidly fatal disorder. To-day I find that during the last eight years I have been studying and daily observing almost every conceivable shape and form of disease I was taught did not exist.

I do not know whether we have yet got beyond the stage when the existence of pulmonary tuberculosis as a chronic condition in children in its grosser forms is largely denied, but there will be a sufficient number of references in this paper to indirectly establish this fact. Personally I have seen a large number of cavity cases, and have watched them from week to week. I have watched cavities for three and four years, and I have seen children with gross disease and weighing four stone on admission, say at the age of ten, who would four years later have the severity of their disease materially lessened, and who would weigh eight stone. If this is not chronic I do not know what is, and if cavity cases are not tuberculous, we have a new disease to which no one has as yet had the temerity to give a name.

I say it is impossible for these cavity and other gross cases of pulmonary tuberculosis to exist as a chronic disease, accompanied by an appearance of health and good physique, unless you admit an exceedingly insidious onset. If you admit this then you must admit that many apparently trivial but persistent irregularities in breathing, chiefly as heard through the stethoscope, have their special import, and if you find a child showing persistent physical signs of this kind then it is time to take action.

Again, if you will not admit this so-called incipient class as being of tuberculous origin, we must come to some very remarkable conclusions.

Our percentages become so altered that I find cavitation occurs about once in every four cases, or between 20 and 25 per cent.

Now the formation of a cavity in the lung involving an actual destruction of tissue is an exceedingly severe condition, but this and other gross lesions I find frequently to be accompanied by a resistance which obviously could not have existed before or the gross condition would not have materialised. In other words, a resistance is maintained and sometimes created just at a time when we should expect an added enfeebled vitality. These are the conclusions we must come to if we do not take into consideration the so-called incipient stage, and we are left with a disease so definite and yet so remarkable as to baffle accurate description. I could support these conclusions with numerous illustrations and much technical detail; but just one more line of thought leading in the same direction, but which I will illustrate.

Take two cases which come under notice on admission, similar in many ways and with some similar apparently trivial deficiency in the breath-sounds. You cannot diagnose these cases at a sitting; you can only suspect; you cannot diagnose them in a week, but see these cases a few weeks later, and you may find in the one that the breath-sounds have returned to the normal while the other shows physical signs which are unmistakable.

Follow this case further, perhaps for a longer period, and you may follow it to the post-mortem room.

But what do these cases and all that I have said teach us? They teach us that certain apparently trivial physical signs, in which outward appearances are misleading, indicate a condition of affairs indistinguishable from that condition of affairs which I have seen time and time again develop, not necessarily fatally or hopelessly, but develop in no unmistakable way.

The man who says this or that is a case of pulmonary tuberculosis may be wrong, but if he is right he is generally in time, whereas the man who says it is not may be missing golden opportunities, and the time required to effect a perhaps not so lasting benefit may be extended from one year to six. It has been said that a case that is not diagnosed until physical signs are beyond dispute is a case bungled, and I agree, but if I am still told I must wait—wait, mind you, for the appearance of the tubercle bacillus in the sputum of a child, who may not cough or expectorate until it is beyond redemption—I think I shall have to give up diagnosis as a lost art and take to growing turnips, where the processes of nature are more visible to the naked eye.

These early cases are the cases to tackle; these are the cases that repay us, and these are the cases that if neglected go to swell the number of our consumptive cases to-day.

I know and I admit that you will cure a certain number of cases that do not exist, but I say this, that if you take and treat one hundred children, of whom as many as seventy are, so to speak, frauds, and cure the lot, you will, on the whole, save money and get better results than if you let them all go, but start to cure the other thirty when there is no doubt about it. It is a question of arithmetic. Would you rather keep one hundred children for periods varying from nine to eighteen months, or would you rather keep thirty children for periods varying from three to six years?

In dealing with this subject I find in my annual report for the year 1910 I used the following words :

It is obvious, especially amongst the so-called incipient class, that doubtful cases exist. The presence of these doubtful cases in the home is, in my opinion, quite justified, as the presumptive evidence is strong, and the probability of their later showing more definite signs great, and because prophylaxis is an important factor in dealing with pulmonary tuberculosis generally.

Prophylaxis, meaning of course prevention, is the real crux of the matter. That is the end for which this Association is working, and some system of prophylaxis must be adopted as a National policy if we are to save the nation from this scourge.

I do not think I have digressed very much, as I hope I am beginning to show that children are not quite the unsuitable soil for treatment they were once supposed to be.

In dealing more especially with prognosis and results, it will be convenient to roughly classify the cases I have had, and shortly to discuss each class seriatim. I have divided them as follows :

(1) Cavity cases, 13 per cent.
(2) Hæmorrhage cases, 3 per cent.
(3) Marked cases, 42 per cent.
(4) Mild cases, 42 per cent.
(5) Exceedingly doubtful cases.

The percentages I give you do not include these exceedingly doubtful cases, as I will discuss them very briefly apart, but they include altogether about 600 cases.

Cavity cases.—These are among the most severe forms of pulmonary tuberculosis, and the percentage, 13, is high. I am very particular about my diagnosis of cavity cases. There are double the number of cavity cases between the ages of ten and fifteen than from three to ten, but I have seen two well-marked chronic cavities in children of three, and several in children of five, six, and seven.

These cases, unless manifestly hopeless from the time of admission, generally hold their own for short or long periods, and some will show evidence of contraction and repair.

These cases may be very chronic, with little or no cough, perhaps no sputum, no rise of temperature, and general good condition. It all depends on how long the cavities have existed while the children lived in their vitiated surroundings before coming to us.

I have told you that I have watched cavities for three and four years, but I have very seldom seen a cavity develop, although I have a number of cases in which I feel sure that cavities would have developed if they had remained in London.

Speaking generally the prognosis is exceedingly bad, and the mortality I should put at 80 per cent., although it may be many years before they die.

The fact that repair can take place is to my mind a matter of much importance on account of the lessons to be learned. The fact that the ultimate result is frequently bad, even in cases that promise well, in no way retracts from the value of the lessons.

Hæmorrhage cases.—This is not so common : I find about 3 per cent. Hæmorrhage may be very smart, and I saw two children of ten die from hæmorrhage. When it does occur it seldom recurs.

Cavity and hæmorrhage are by no means necessarily associated, and perhaps in these particulars the hæmorrhage of children is inclined to differ from the hæmorrhage of adults.

The average age of these cases was twelve, with not a single case under ten. Hæmorrhage necessarily involving a breach of surface is a serious condition, but the prognosis is not really bad.

I consider the lungs of children capable of healing after hæmorrhage; but I should keep cases of this kind under treatment for a not less period than three years.

Marked cases (42 per cent.).—These all show definite physical signs which persist from week to week. These physical signs are mainly of the kind technically called râles or crepitations, which are described as being coarse, hard, bubbling, crepitant, or fine, according to their character, the main feature about them being that they are persistent. Some of these cases are distinctly severe, and only just stop short of cavitation; others are not so severe, but the condition is undoubted.

These children live and enjoy life, and have an outward appearance of health. The prognosis is from fair to good. The time required for treatment varies from one to four years; but their future depends on their after-life, mode of living, and general environment. I do not specially refer to their ages as I did in the cavity and hæmorrhage cases; they are of all ages.

Mild cases (42 per cent.).—Here in some minds the doubtful element begins. Personally, as the result of continued observation, I am of opinion that they are of a tuberculous nature, and I am also of opinion that they can be detected.

Some of them may have reacted to tuberculin tests, but I cannot definitely prove the diagnosis.

It is a kind of idea that gradually becomes instilled into you whether you will or whether you won't. I used to be very sceptical about these cases once; but you must now take my opinion for what it is worth.

They all show some trivial abnormality of the breath-sounds of a moderately persistent character.

With the exception of the very few cases I have followed to a fatal or hopeless stage they all get well; but I usually keep them a year or eighteen months.

Some critics will say, "Of course they get well as they never had the disease"; but I cannot get away from the fact that I notice an abnormal condition, and the reasons given by certain critics of the causes of these abnormal conditions do not satisfy me.

I have already argued these mild cases before you very briefly in three different ways.

I took the very severe cases and argued backwards; I took the mild cases and argued their development, and by cutting the mild cases out of our calculations I argued a deduction that was certainly improbable.

I say finally on this point it is easier to believe in these mild or incipient cases; it is easier to believe in their detectability and subsequent cure than it is to disbelieve.

We now come to the class of case which I call the exceedingly doubtful. I have not included them in my percentages, as to do so would lead to erroneous conclusions, but they form between 20 and 25 per cent. of my total admissions. When I suggested 70 per cent., referring to them as frauds, and discussed arithmetic, it is obvious that I was over-estimating their numbers. Substitute these new approximate values and you will see there is considerable truth in what I then said.

Many of these cases are children under the age of five. Personally I am not impressed by amount of pulmonary tuberculosis at this age, although I know I have seen a few well-marked cases and cases of cavity, but I am inclined to think that when tubercle attacks children under this age it is more likely to attack the meninges of the brain or the bones and joints, or to show itself in the acute miliary form rather than in the chronic pulmonary.

Some of these children may even have reacted to tuberculin tests, but this is not my subject.

Some have had heart disease and others something else. Some have not selected their parents with care and others again only shows signs of malnutrition.

These latter may be potential cases; certainly their general resistance is much impaired; but I think we increase their powers of resistance, and malnutrition is not a common failing with children who leave us.

I do not keep them long, but in addition to the fact that we help to build up their constitution we teach them the value of fresh air and plenty of it, and if the correspondence that passes between the nurses and ex-patients is any indication there is more in this than appears at first sight.

I wish more definitely to point out to you, however, that the presence of a certain number of these cases in a children's home for pulmonary tuberculosis is inevitable.

Speaking generally, all the children increase in weight and do well, and active physical signs disappear after periods varying from six months to three years.

Some time ago the figures of some 500 cases, spread over a considerable time, gave me an average gain in weight of one pound per week per child.

I always endeavour to keep the children for at least three months after all active signs have disappeared, and I should keep them longer rather than discharge them before an oncoming winter.

The cases that are the least satisfactory are those of a severe nature that are admitted after the age of fourteen. These may be considerably benefited, but they are discharged " over age " when they reach sixteen years. The letting loose on the public of these half-treated cases who are virtually young men and women is certainly a result I must allude to.

The rising generation are the fathers and mothers of the future generation, and, while not believing in the theory of direct heredity, I cannot help thinking it is unfortunate that many of these cases are, so to speak, just helped over the stile that separates childhood from maturity, in which latter state, being thrown on their own resources, they may only exist for short periods, but they may live long enough to leave the nation tainted legacies of doubtful value.

The system that permits this is not a fault in its inception, it is at fault because of its limitations.

I have used the word " cure," but it is a word which is hardly accurate. You cannot cure consumption. You cannot cure a cut finger, but you can heal it and the scar will remain, the size of the scar depending on the severity of the injury and the time it took to heal. The simile, although not strictly accurate, is somewhat apt.

Arrest seems to me to be the most suitable word, and to say that permanent arrest is within the region of extreme probability is to put it mildly.

I should like here to quote extracts from the report of the late Sir William Broadbent, who visited Millfield seven years ago. He used the following words:

A difficulty, however, presents itself to my mind. Consumption pursuing an ordinary course is, according to my experience, comparatively rare in childhood.

He also says:

In presenting my conclusions as to the suitability and value of the Millfield Home in the treatment of children suffering from pulmonary tuberculosis, I am influenced more by the results of the experience already obtained than by theoretical considerations.

And again he goes on:

As I have already said, the consideration which has had the greatest weight with me is the condition of the children presented for examination. In several of these I found evidence of extensive disease of the lungs, while in appearance, muscular development and capacity for exercise they were practically in good health. I cannot, of course, say from my own knowledge that the disease was tuberculous, but the physical signs were such as were consistent with arrested tuberculous disease.

The Millfield Home, which has accommodation for 120 beds—and the beds are always full—is situated in its own grounds, which run down to the sea-shore about a mile from Littlehampton in Sussex. The children nearly all bathe freely in the summer. We get our winds and we get our storms now and then, but a rapidly moving atmosphere coming off the sea and being free from dust does not appear to have any harmful effect.

But we get, in addition, a considerable amount of sunshine, and the general progress that is usually in evidence among all classes of cases seems to be more marked after spells of sunny weather.

We have large dormitories with crossed ventilation and a limited amount of balcony accommodation, the children here sleeping practically out of doors.

They take regular exercise, attend school, and some are given light work in the garden or elsewhere.

The school-room is a large room almost completely open to the air on one side.

Years ago, before the experience Millfield has given me, I do not think I should have selected the neighbourhood of Littlehampton as a suitable place for pulmonary tuberculosis, but I should not hesitate now.

I believe that children with pulmonary tuberculosis, if placed in suitable surroundings, have great recuperative possibilities, perhaps greater than adults.

I believe that scar-tissue is rapidly and early thrown out, this being, of course, the natural process of repair.

I am led to these conclusions to a large extent by the fact that the children's physique and general appearance of health after a short stay in our home is out of all proportion to the grossness of their lesions, and also, because in the few post-mortems I have done the amount of scar-tissue has been one of the predominant features. I think this view is further borne out by the number of old tuberculous scars that are found post mortem in people who have died from other causes.

I say this throwing out of scar-tissue is the reason of the chronicity of cavities, and I say this is the reason why hæmorrhages are infrequent.

This points to one thing, and to one thing only, and that is, that children's lungs have a natural tendency to recover, and I think I am justified in repeating the statement that children with pulmonary tuberculosis if placed in suitable surroundings have great recuperative possibilities.

In fighting the battle against consumption, if you want to strike at the root of the matter and not be content only to lop the branches you must deal with the children.

It is becoming a matter of national moment and legislation is in the air, but the legislation that is being wafted upon us, although excellent and necessary, would be more valuable if it were an extension of a system which had originated with the children.

At the present time, as far as I am aware, the children are only catered for by charitable institutions, perhaps a few public institutions, and certainly by the Metropolitan Asylums Board, but unfortunately in this direction, under the Poor Law, guardian control ceases at the age of sixteen.

Something must be done with the children if we are to have a semblance of real success, and there are many ways in which this could be done.

As compared with the treatment of adults, the treatment of children opens up a field which is probably vaster, which as an investment is more profitable and individually cheaper, and for the benefit of the human race in general, and the British nation in particular, is of paramount importance.

SURGICAL TUBERCULOSIS: ITS NEEDS AND TREATMENT.

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Before discussing the needs and treatment of surgical tuberculosis it is desirable to have some conception of the nature of the condition. In its broadest sense the name is usually understood to apply to all forms of tuberculous disease, other than pulmonary, which may be treated by surgical measures.

The term is a bad one, as it tends to imply the necessity for recourse to radical surgery. Under particular circumstances surgical measures may be adopted in almost every form of tuberculous disease, but on the contrary often need not be applied to the treatment of any form.

I shall consider the needs and treatment of surgical tuberculosis, especially in reference to tuberculous disease of the bones and joints, but much of what will follow will apply with almost equal force to other forms of surgical tuberculosis.

Before Pasteur's great discoveries and when tuberculous arthritis was not separately classified, but was commonly confounded with a diffuse group of bony inflammatory conditions, surgical treatment was almost futile.

A new era opened with the work of Lannelongue in France and Koenig in Germany. Tuberculous disease of the bone removed from the chaos of chronic bone diseases became clearly defined, and took its proper place. Radical surgical treatment, supported by the recent discovery of antiseptics, evolved logically, and resulted in attempts being made where possible to remove completely those tissues infected with the tubercle bacillus. This practice, possible and efficacious with small tuberculous foci, exposed the patient to serious risk when applied to extensive bony lesions. The initial danger was extreme; frequently the most extensive operations could not secure total extirpation of the tuberculous lesion, and the deplorable orthopædic results that so often followed, coupled with the frequent production of secondary visceral or bony lesions, led to the abandonment of these heroic measures.

Next there followed a less daring and less radical surgical period which largely represents the recognised practice of the present day.

It evolved naturally when the disadvantages, dangers and failures of more radical methods were better appreciated.

This limited surgical practice, while abandoning attempts at complete removal of the more extensive bony lesions, confines itself more to an attack, where practicable, on the abscess so often associated with the disease. Complete removal of the focus of disease is only attempted when easily feasible, and, indeed, sometimes even partial removal or scraping alone is undertaken.

This method of treatment, while being less dangerous and also causing less crippling than the former, is still open to grave objections which need not be entered into here.

It is being gradually abandoned and replaced by conservative methods of treatment as the application of these become better understood. Indeed, the lack of facilities for the employment of conservative measures is now probably the chief bar to their more general employment.

Conservative treatment had long been confounded with convalescent treatment, from which it differs entirely. The prejudices, natural and proper, which this misconception compelled, are with increasing knowledge gradually being dispelled.

Mutilations, excisions and amputations formerly considered essential are rapidly being displaced by measures which render the use of the knife commonly needless and unwarranted.

Joints and limbs formerly sacrificed are saved and their functions often restored. Indeed, during the last three and a half years, out of over 700 patients suffering from tuberculous disease of the bones and joints who have been under my care at Alton I have only had to perform one amputation. Moreover, that amputation was necessitated, not because of the tuberculous disease from which the patient suffered, but because a previous operation had permitted added sepsis to complicate the condition.

Conservative treatment, then, strives to preserve and restore the part diseased and not to complete its destruction.

The greatest hope for the vast army of tuberculous cripples lies in the principles of conservative treatment becoming more widely studied and applied early and intelligently. Tuberculous disease, to-day the most prolific cause of crippling in this country, will then be one of the least important causes, and the mortality from surgical tuberculosis at a moderate estimate will be reduced to a tenth of what it now is.

These assertions are facts which from my observations at Alton I claim are capable of demonstration and proof.

It will be my privilege presently to indicate how these much-to-be-desired results can be obtained, and that economically and expeditiously. With confidence I assert that the pessimism of the past which regarded the condition of the hunchback as so hopeless may be replaced by an optimism in the future which foresees means by which the existence of such a deformity may be with certainty prevented.

I refrain from discussing the incidence of the disease.

It may be approximately estimated, but to enter into the reasons as to how such an estimate would be arrived at would occupy too much time.

Surgical tuberculosis must no longer be considered a local infection. It is a general disease of which the bony, articular, lymphatic or other lesions are local manifestations. This point is of fundamental importance (Broca, Calvé, Tubby, Hutinel and many others). Until this is recognised treatment cannot be completely effective, and its recognition involves the logical necessity of treatment being undertaken on two lines—general and local. The best results can only be obtained by placing the patient under the best conditions.

Necessity for General Treatment.

A general disease demands general treatment. To reinforce and strengthen the natural defences against the attack of the tubercle bacillus is the surest way of defeating this attack. This is immediately evident in early and so-called pre-tubercular cases, where good general conditions alone will often convert a delicate ailing child into a strong and vigorous one. It is equally, if not more important when the disease has obtained a firmer hold and local manifestations have appeared. Life in the open air, far from towns, in a dust and germ-free atmosphere, under the bactericidal and tonic action of the sun is a first principle in antibacillary theraputics. "By these means the patient himself will make the whole fight against the bacillus" (Casteigne).

The requirements of general treatment may be considered under the following headings: Climatic, hygienic, disciplinary, dietetic, drug, other, *e.g.* helio-therapy, balneo-therapy, etc.

CLIMATIC.

Mountain, country, or marine air is indicated. Mountain sanatoria for surgical tuberculous patients are almost out of the question in this country because the mountain climate ideal for treatment in Great Britain is unobtainable. Our mountains are too enshrouded in cloud and fog, the rainfall is excessive, the amount of sunshine too limited, the extremes of temperature too severe. One of the great advantages of mountain treatment as demonstrated by Rollier of Leysin and more recently by Lenormant is the heliotherapeutic effect obtainable. This has led to the error that high altitude and heliotherapy are synonymous, but this is incorrect. It has been shown by Hahn, Robin and Binet, Duclaux, Barbier and other that if the actinic power of sunlight is intense on the mountains it exercises its greatest effect at the sea-side.

Suitable treatment, then, in England could be best obtained at the seaside or in the country.

Speaking generally, I believe that country treatment is better for the early and marine for the more advanced or chronic cases, including those with old sinuses. To this rule, however, there would be exceptions.

Where situated.—The hospital should be reasonably remote from a town, in a district where tuberculous disease is known to be little present. If in the country, it should be at a fair elevation, preferably on the slope of a hill facing south so as to secure the maximum sunshine. A sheltered situation is not a necessity, wind is no disadvantage; on the contrary it exercises a bracing and stimulating effect. The district should be sunny, the rainfall not excessive, and the soil porous and one which quickly dries after the rain. The institution should, therefore, not be in the neighbourhood of a river or in a swampy district where the air is excessively humid. Sudden extremes of temperature are undesirable.

If marine, it is of first importance that the institution should be remote from a town. A sea-side pleasure resort is therefore at once contra-indicated because here, even though the climate of the district may be extolled, the presence of excursionists and others robs the patients of what at the sea-side is a prime necessity—untrammelled use of the beach.

A model marine resort is Berck-sur-Mer in France. The industry of this town may be said to be the treatment of patients suffering from surgical tuberculous affections. They have the unrestricted use of the immense and magnificent beach. The presence of cripples is not regarded with abhorrence, but with pleasure because it is a source of profit. A town cannot at the same time be a pleasure resort and devoted to the treatment of tuberculous cripples. If the tuberculous are to be treated, then the place must be theirs to the exclusion of all others.

A marine hospital should abut on the sea and face the sun and prevailing wind to derive maximum benefit from all three. There should be an extensive beach of firm sand on to which the patients can be wheeled or may walk unhindered by the pleasure-seeker. A low exposed littoral is to be preferred to a tree-covered sheltered one, and there should in addition be an extensive area of foreshore over which the tide advances or recedes within wide limits. The prevailing wind blowing over such a beach becomes charged with substances which exercise a markedly stimulating effect on the patient. Sea, sea-breeze and sun are adjuncts to the cure which cannot be neglected.

Invigorating country and marine breezes in a sunny district exercise a marked effect in improving the appetite and general condition of immobile and recumbent patients which should not be overlooked.

The best results would, in my opinion, be obtained by the establishment of two institutions, or one institution with a branch hospital, the one in the country, the other at the seaside, both hospitals under the same management, so that a continuity of treatment could be assured. It should be possible to transfer patients from one hospital to the other so that the benefits of change of air and scene could be obtained. A case which is at a standstill or going slightly backwards could then receive the added stimulus which would often lead to cure.

Hygienic.

The value of abundant fresh air in the treatment of tuberculous disease is so well recognised that it need not be laboured here. The hospital should be so designed that the patient practically lives in the open air but yet remains sheltered from rain and snow.

That bodily attention which can only be obtained by the best nursing may be included under this heading. The skin of patients, immobilised in the ways indicated for the treatment of tuberculous arthritis, requires the most careful attention to prevent the formation of sores. Indeed, in no class of patients is the necessity of that extreme personal attention which may be summed up under the heading of personal hygiene so necessary as in the tuberculous.

Disciplinary.

Patients accepted for treatment for long periods in large institutions need kind, but firm and tactful handling and occupation suited to their limitations, unless they are to lose that mental distraction which is a powerful aid to cure. Moreover, left without occupation they will become discontented and degenerate. In the treatment of pulmonary tubercle this has already been apparent. Lack of kindly discipline and well-ordered occupation has brought sanatorium treatment discredit which has been more than counterbalanced by the benefit to be derived from regulated work so ably advocated by Paterson, Philip and others in suitable cases.

Children should be educated, adolescents trained, and adults occupied according to their capabilities.

That such wholesome discipline is of the greatest benefit a visit to Alton will quickly prove. Happier patients in any hospital could hardly be found. There is none of the cringing air sometimes to be observed in the child recipients of charity which is so objectionable and distressing. The boys become manly little fellows, polite and engaging, the girls gentle and attractive, and in both there is a conspicuous absence of self-consciousness or self-pity. Their characters become moulded on healthy lines which will fortify and aid them in after life.

Dietetic.

Beyond stating that a liberal, plain, varied diet suited to the sometimes capricious appetite of the tuberculous should be prescribed, I make no remarks. Special diet will, of course, be indicated for particular cases. Milk and meat are of prime importance.

Drugs.

Owing to limitations of time and to technical considerations I shall not dwell on this and other forms of general treatment.

Local Treatment.

This matter is of extreme importance both for the cure of the local lesion, the prevention or correction of deformity, and the management of complications such as abscesses and sinuses. Indeed, its importance can hardly be sufficiently emphasised. It is essentially a matter for a specialist, and perhaps no other disease requires more a specialist's care than does tuberculous disease of the bones and joints if the best results are to be obtained. That it does not receive this attention is shown by the fact that tuberculous disease causes more crippling than any other condition in this country. The best results are undoubtedly obtained by the employment of conservative methods applied with minute attention to detail. Each case requires its special treatment. Only in this way can results approaching perfection be obtained.

Speaking generally, for the more severe local lesions it may be said that there are three stages of treatment depending upon the progress of the disease, viz.

(1) Acute commencing and progressing disease which requires absolute rest in the recumbent position, with immobility of the part attacked combined with the adoption of special means to correct or prevent deformity and abolish muscular spasm. The length of this stage of treatment will vary with the nature of the case, the resisting and reparative powers of the patients (which general measures will improve), the virulence of the infection, the "soil" of the patient, the site and extent of the lesion, the presence or absence of other lesions, the age of the patient, etc. Only prolonged experience and considerable judgment can tell when this stage may be abandoned. It is ridiculous to assert that every case requires a similar, even approximately similar, period for treatment. The time required will vary within very wide limits.

(2) The chronic or subacute stage. Here recumbency is as a rule not necessary, but very complete immobilisation of the part attacked is essential for a double purpose: (*a*) to allow repair to take place, (*b*) to prevent the occurrence or increase of deformity.

(3) The stage of convalescence. Now complete immobility is not essential, but protection or support which may be given by light, accurately fitted removable splints is usually sufficient. These may usually be discarded while the patient is at rest but should be worn at other times.

These periods of treatment are mentioned as general guides. They apply especially to the two commonest forms of bone and joint tuberculosis—spinal caries and hip disease. The length of time required in each stage of treatment will vary within very wide limits, and the decision as to when one may be abandoned and the next undertaken requires much skilled knowledge. The problem with regard to adults differs to some extent from that of children. In adults, radical measures, especially in certain form of tuberculous arthritis, may be more often indicated, but speaking generally, the great majority of cases will do better if conservative measures are alone employed. As a general rule, given proper technique, aspiration of abscesses with or without the employment of modifying fluids, presents the surest, safest, and most effectual way of dealing with this exceedingly common complication. As I propose showing elsewhere, healing after aspiration fundamentally differs from healing after incision, inasmuch as with aspiration it is centripetal, after incision it is commonly centrifugal even when sinus formation does not ensue. This is a point of importance, and ever to be borne in mind in deciding which method of treatment is to be adopted.

THE NATURE OF THE INSTITUTION REQUIRED: GENERAL CONSIDERATIONS.

From what has preceded it may be inferred that I advocate a special hospital or hospitals, administered by a skilled staff, and situated in a district known to be peculiarly suitable for the treatment of surgical tuberculosis. Moreover it will be obvious that to procure the best results at the least expense the institution must be a very large one, and indeed only by the establishment of a large institution with very many beds can the fullest efficiency and economy be at the same time obtained.

The hospital at Alton founded by Sir William Treloar may be taken as a model. The results of treatment undertaken there is my justification for this statement. More nearly than any other institution with which I am acquainted it fully meets the needs of those afflicted with surgical tuberculosis. It is located in a region where tuberculosis is relatively uncommon. It is so situated that the patients derive the maximum benefit from sun and air.

Its wards are light and airy, and well adapted for the nursing of tuberculous patients.

Its equipment fulfils the needs of the work it undertakes. It is large, and moreover there is unlimited room for its expansion. Not only is the crippled child healed there, but he is trained in some occupation specially suited to his capacity.

It needs no argument to affirm that neither the general and children's hospitals nor the cripple and convalescent homes scattered all over the country can cope with the problem of the treatment of surgical tuberculosis. The former cannot detain the patients for adequate treatment, neither does their situation permit them to get the best results.

The latter in the majority of cases have neither suitable equipment nor staff available.

The need for special institutions has long been recognised and advocated by expert authorities in the medical profession.

Very tardily the necessity has been appreciated by some of our municipal authorities. But the few efforts made show a lack of grasp of the essentials for the solution of the problem and suffer grave defects. In the first place, these schemes provide for treatment in the immediate locality, and thereby is lost the benefit of altered climatic conditions. The institutions are small and can neither employ nor attract a special staff. They cannot manufacture the orthopædic appliances they require. It is still not realised that skilled knowledge of how to efficiently support and immobilise a tuberculons lesion is of infinitely greater importance than knowledge of how to remove the lesion—a crude cure at best. It will therefore be always impossible for such institutions to obtain either the best curative or orthopædic results. A local hospital must always be at a disadvantage. The large dual hospital under one control in specially selected localities is, in my opinion, the best solution to the problem.

In building and designing such a hospital the special work it will have to perform must be always kept in view.

The responsibilities devolving upon those entrusted with the foundation and maintenance of such institutions are heavy. The problem must be viewed from every standpoint, a correct perspective must be obtained, there must be nothing superfluous, but no essential must be omitted. To deal with the subject exhaustively is impossible in the space at my disposal, but certain points may be indicated.

It having been granted that treatment in urban hospitals is not only unsatisfactory but costly and undesirable, their place in the scheme will be limited to the diagnosis of these affections. They become receiving houses for these patients, and from them or other centres at frequent regular intervals the patients would be transferred to the special hospitals about to be described.

These special hospitals must be large, the larger the better, for in this way only can cost of administration and maintenance be kept low. Multiplication of such institutions means an enormous increase in the expense and a corresponding diminution in the efficiency. They must be specially and most carefully designed for their particular work, and here great experience and foresight is necessary. While they should be cheaply built they should be substantial. It is an error to imagine that carelessly erected wooden buildings are either suitable or economical. The first cost may be low, but cost of upkeep quickly counterbalances that, and the danger, discomfort and inconveniences arising by the employment of these buildings seriously militate against any supposed advantages. As abundant fresh air and sunshine are therapeutic agents of paramount importance, ample provision should be made for these, in the form of extensive balconies with a southern aspect, and provided with shelter from the rain. The wards should be so constructed that the work of the nurses and domestics is reduced to a minimum; in this way much subsequent expense will be avoided.

Both adults and children suffering from surgical tubercle may be conveniently treated in the same institution because the treatment and requirements are essentially the same, but it is undesirable that children should be directly associated with adults. Children should therefore be housed in separate blocks, and special provision should be made for the prevention of epidemic disease among the children. This latter necessity makes the provision of an observation block for the reception of new cases, where each child is treated on admission in a separate cubicle, a prime necessity. This system has proved of great value at Alton.

The situation of the hospital requires the most anxious consideration. The land on which it is built should be remote from towns, but nevertheless easily accessible. It is an advantage for arrangements to be made before the site is finally settled for a private railway platform to be built on the estate for the reception of patients and of goods. Negotiations should be conducted with the railway company at the outset for liberal terms and advantageous service, as otherwise expense and annoyance is likely to follow.

If the land on which the hospital is to be built is of little value, so much the better, as it will be correspondingly cheaper to purchase. The hospital should, if possible, be built on the slopes of a hill having a southerly aspect, so that the maximum of sun and air may be obtained and good drainage be secured. An abundant and pure water supply is a first necessity. Care should be taken that the cost of water and drainage is low, and that the rates to be levied should not be excessive. Provision must be made for reliable and economical heating and lighting, and the system adopted must be elastic, and able to cope successfully with any sudden strain placed upon it.

Arrangements for internal administration must be planned with minute care. A central kitchen with plant for economical but good cooking is essential—a generous allowance of suitable food suited to the capricious appetite of the patient being necessary—and the stores, larders, pasteurising room and other necessary offices must be designed with attention to the smallest detail. Buildings must be so grouped that the food and stores may be distributed expeditiously and safely, and refuse removed without danger or offence. These and other details must receive careful attention before the hospital is built. A modern laundry should be provided.

In arranging accommodation for the patients to be admitted there should be a clear idea as to the proportion of patients requiring recumbent or ambulatory treatment. This is a matter of considerable importance, because provision for each class must be made and their special requirements kept in view. In France leading authorities estimate that at least 50 per cent. of the beds are required for recumbent cases.

At Alton the number is still higher because the percentage of serious cases is higher than at similar institutions in France, one reason being that the number of beds available in England at present is so small. I estimate that at least 70 per cent. of the patients require entirely recumbent treatment.

Bearing in mind the special work to be undertaken, careful consideration must be given to the size of wards, arrangement of wards, arrangement of special wards, of balconies, sanitary arrangements, ward fittings, kind of cots, beds and stands best adapted for nursing these patients, arrangements for septic cases, distribution of food, accessibility of kitchens, stores, and dispensaries.

Provision for infectious cases, modes of avoiding epidemic disease, arrangements for dealing with patients with scalp infections, rhinitis, otorrhœa, vaginitis, etc.

The equipment of the hospital for treatment is a matter of great importance and would be relatively inexpensive for the work to be dealt with. While not expensive, it must be thorough and perfect. It would include an operating theatre and aspiration rooms. A serviceable X-ray department is of extreme importance. A large well-lighted plaster room with waiting-room and a splint room for the manufacture of splints from casts is very desirable, as it is cheaper and very much better to make splints than to buy them. Not one splint has been bought since we have been established at Alton; every splint required has been made on the premises, and those splints which the patients take away with them have not cost the hospital anything. The majority of patients leave with light, strong, suitable, well-fitting splints which we make ourselves. Patients are charged merely the estimated cost of materials, and they obtain very much more suitable appliances than could be procured from an instrument maker, at a fraction of the cost. Out of 190 discharged last year 141 left with splints or spinal jackets.

A compact bacteriological laboratory is of importance. Cultures should be taken of all sinuses on admission to the observation wards, and patients with added infections nursed in wards reserved for their specific added infecting organism, *i. e.* streptococcal cases in one ward, staphylococcal in another, mixed infections in a third, and so on. All these points of detail merit consideration.

Provision may be required for light and bath treatment.

The equipment of these special hospitals should then be as perfect and comprehensive as possible. Only thus can the best results be obtained in the shortest time at the least expense. Conservative treatment will be chiefly required, but undoubtedly, in the majority of cases, conservative treatment implies a great deal if properly undertaken. The best treatment is in the end the most economical treatment, and every facility should be given in the equipment for the best treatment.

THE STAFF.

Both medical and nursing staff require special training. The medical staff should be under a medical superintendent skilled in both treatment and administration. He should have absolute responsibility, freedom of action, and unhampered control.

In France, the surgeons in charge are largely relieved of administrative duties. This is good, because it enables the chief medical officer to devote his time and experience to treatment, but the necessity should be emphasied that the manager or secretary of the hospital should work under the medical superintendent and not independent of him. This is necessary for the avoidance of friction and to secure efficiency and economy. In other words the medical superintendent should be relieved of the routine of administrative work, but should be held responsible for the manner in which it is performed. I can see no possible objection to the medical superintendent being permitted to treat private patients afflicted with the special disease to which he has devoted himself. It will ensure him better prospects, raise the standard of his work, and make him in every way a better and more capable practitioner.

The time which he may devote to private practice will of course be limited by the time he must devote to the service of the hospital. This system is adopted with conspicuous success in France. Only in this way can the special work be made adequately attractive.

It must be remembered that the medical officers will be called upon to perform duties regarded by many as monotonous, certainly exacting in the extreme, and involving much attention to detail, and this work will probably have to be undertaken in remote districts possessing few attractions.

The number of beds per medical officer would depend on the standard of work required and the severity of the cases admitted. It must be remembered also that for good work to be done the hospital would require the services of both a competent radiographer and bacteriologist, the former being especially needful.

The nursing staff, under a competent matron, requires special training. The sisters should be well qualified for their duties and have received a thoroughly good general hospital training, and in addition special training for this particular work. The nurses should be probationers accepted for training in this special work. It is an advantage if they have received no previous training. Ordinary hospital nurses are in my experience unsuited for this special work, except as sisters. The best ones can usually obtain sisters' posts or remunerative private work. The remainder are certainly not good enough for the special duties they are called upon to perform.

Nurses specially and carefully trained from the start give most satisfaction and become thoroughly useful and reliable. The number required will to a considerable extent depend upon the design, conveniences of the hospital, and the standard of work required. It will probably be found that at least one nurse to from four to five patients will be necessary if proper attention is to be given to the patients.

For male adults I should advocate male nurses, and would suggest the employment of retired R.A.M.C. orderlies or similar attendants.

Classification of Cases.

It will be found that cases come for treatment which are acute, subacute, chronic, and with the tuberculous mischief apparently arrested but with more or less deformity remaining. A considerable proportion will have abscesses or sinuses. The length of time these different cases call for treatment varies enormously. Early cases demand careful treatment until the disease is arrested and danger of subsequent deformity avoided. These offer the best prospects of complete cure without subsequent, or with little, deformity. It is of the utmost importance to admit these for treatment at the earliest possible moment, and the value of early diagnosis for this purpose cannot be over-estimated. Deformed cases should have the deformity corrected or reduced where possible. Old, quiescent, badly deformed spinal cases, without abscesses or sinuses, which cannot have the deformity corrected, should be discharged as soon as that benefit which change of air and good food has produced has been gained. The deformities in old hip and knee and other cases may be lessened by osteotomy and other treatment, which can be given in orthopædic or general hospitals and consequently need not be referred to the special hospital. Cases with abscesses unopened are essentially suitable for conservative treatment, and the result of such treatment is usually brilliant.

Patients with sinuses infected form the most serious class.

It is noteworthy that French authorities estimate that 75 per cent. of these sinus cases suffering from spinal lesions never recover. Our experience at Alton is that a considerably larger proportion may be cured, but they are exceedingly difficult cases. The prognosis is always worse in these than in cases not handicapped by added infection, and it may be estimated that at least 50 per cent. of patients suffering from spinal caries who have spinal abscesses opened progress to sinus formation. Not more than from 2 to 5 per cent. treated conservatively develop sinuses, and these are never very serious. I have not seen one single case develop a serious sinus, and every one of our cases has recovered.

The whole question of length of treatment required for the different classes of patients is a very complex one. It will to a large extent depend upon facilities for treatment and after-care.

This may certainly be said—that if well-organised means for after-care be devised as are in force at Alton, the length of stay at the special hospital may be greatly lessened without undue risk to the patient. I shall return to this later when discussing the after-care of patients.

Education, Training, and Employment of Patients.

Modern requirements demand much more than mere treatment of the disease of the patient. More is required both in the interest of the patient and the community. No scheme for the treatment of surgical tuberculosis can be considered complete unless simultaneously provision is made for the patient, if a child, to receive that education which his condition would permit; if an adolescent, technical training in an occupation which would assist or enable him to earn his livelihood when discharged; if an adult, an occupation suited to his limitations. At Alton all children receive such education as their condition permits, and on discharge commonly have not only made up for the loss which their enforced absence from school has engendered, but often because of the care taken with their education are perhaps even in a better position than if they had attended school uninterruptedly.

In our College crippled lads are received from the age of fourteen to eighteen for technical training in an *occupation suited to their limitations* for a period of three years, and on discharge are able to take up remunerative and self-supporting occupations, to their own gain and that of the community. It need hardly be said that under the complex social conditions now prevailing the utmost care and judgment must be exercised in the selection of suitable occupations.

The requirements of the adolescent and adult convalescent patients might be best met by the establishment of an industrial colony adjacent to the hospital but in its own separate grounds. Such a colony would not be directly remunerative, but would to a considerable extent contribute to the cost of its maintenance.

It would have to be distinctly understood that all patients as soon as sufficiently cured to return to their work and able to cope with outside conditions should be discharged. Only those would be detained whose condition is such that they would be unable to work if discharged.

This aspect of the problem is so vast and important that I cannot do more than allude to it in this paper.

The After-Care of Discharged Patients.

This is a most important and too often neglected matter. If the full benefits derived from treatment are to be maintained and the discharged patient is to receive the most valuable assistance a carefully thought-out system is indispensable.

The system in force at Alton is as follows:

When a patient is discharged a detailed letter is sent to the parent or guardian explaining exactly how the future of the patient is to be guarded. He is informed that the splint provided is to be removed nightly, and the patient's skin washed and powdered to prevent it from becoming sore. Directions are given as to when the splint must be worn, when it may be discarded and how it should be put on. Instructions are given as to the diet and hygiene.

London parents are requested to bring the discharged child within three months of discharge to our out-patients' department in London for inspection and advice. They are instructed to notify me at once if for any reason they should be anxious about the patient's condition, or if they do not understand directions given. They are instructed in such matters as the amount of rest the child requires, the school he should attend, the occupation he should obtain, the precautions which should be observed, etc.

For the success of this scheme the co-operation of the parent or guardian is essential, and while this co-operation is gladly given by many, it is a matter of real regret that it is denied by some.

In the patient's own interest it would be desirable if such co-operation could be compulsory. By this means a recurrence may often be avoided, the interests and future of the patient safeguarded, and if recurrence of the disease takes place it may be immediately treated.

I would just allude to such forms of surgical tuberculosis as tuberculosis of the glands, skin and peritoneum. These conditions could be equally well treated at such a special hospital as I have already described, and indeed would be then better treated than at present, and under the best possible conditions.

Their treatment then in such a special hospital is advocated. A number of cases of glandular tuberculosis have been treated at Alton with considerable success. Conservative methods are favoured, and the unsightly scarring so common after radical treatment may be usually avoided.

STATISTICS FROM ALTON, WITH COMMENTS.

It should be pointed out that the cases received include the most severe forms of surgical tuberculosis. From my own observations, and from reports published, I am able to state that the proportion of serious cases at Alton is considerably higher than at the somewhat similar institutions which have been long established in France.

It will be seen that out of 707 patients received at Alton, no fewer than 295 suffered from tuberculous disease of the spine, and of these a large proportion suffered from abscesses, sinuses or paraplegia.

Patients are entered as discharged who died. Out of the 707 who were admitted, eight died in hospital, and I have ascertained that eight died after discharge. Of those who died after discharge the condition of seven was hopeless when the patient left. Where possible, the parents are informed when the patient's condition appears to be absolutely hopeless, as sometimes they prefer to remove the child.

Possibly other patients have died of whom I have no record, but these must certainly be few in number, as every endeavour is made to remain in touch with discharged patients. It should be noted that tuberculous disease was probably not responsible for the death of three of these patients.

The mortality, then, amongst tuberculous patients since the Hospital was opened in September, 1908, was in the hospital 1·14 per cent., altogether 2·3 per cent., possibly more, certainly not much more.

I can find no more favourable figures anywhere bearing in mind the nature of the cases treated.

By apparently cured is meant that the disease appears to be quite arrested, abscesses absent, sinuses healed, and the patient perfectly able to resume his ordinary life not under skilled supervision.

The number of cases readmitted for recurrence of the disease is under 2 per cent. Recurrences may have occurred which have not been readmitted. I have record of recurrences in only two patients who were not readmitted.

It should be mentioned that the patients are classified according to their principal lesion. A very large number have multiple lesions, but these are called cases of "multiple tubercle" only when occurring simply in the smaller joints, and not affecting spine, hip, or knee. For example, a patient with tuberculous disease of the spine, hip, and knee would be entered as tuberculous disease of the spine.

Cases entered as "other tuberculous lesions" include patients suffering from bony tuberculosis in whom a joint is not involved, or cases of tuberculous peritonitis, adenitis, etc.

Table III shows the average duration of treatment of the various conditions.

Tuberculous Patients Admitted and Discharged, with their Lesions.

	Spine.	Hip.	Knee.	Ankle.	Mult.	Other.	Total.
1908 : Admitted	32	19	21	2	2	4	80
Discharged	1	*nil*	1	*nil*	*nil*	*nil*	2
1909 : Admitted	83	59	20	7	3	21	193
Discharged	17	26	18	1	2	13	77
1910 : Admitted	61	52	23	7	3	10	156
Discharged	58	26	33	9	3	10	139
1911 : Admitted	80	61	28	6	6	13	194
Discharged	82	64	22	5	4	13	190
1912 : Admitted	39	22	17	3	2	1	84
Discharged	36	24	12	2	4	4	82

Total tuberculous patients admitted to May 31st, 1912 . 707
" " discharged " " . 489

Under treatment May 31st, 1912 218

Total Tuberculous Patients, with their Lesions to May 31st, 1912.

	Admitted.	Discharged.
Spine . . .	295 . .	196
Hip	213 . .	140
Knee . . .	107 . .	83
Other . . .	50 . .	40
Ankle . . .	25 . .	17
Multiple . . .	17 . .	13
	707	489

Results of Treatment.

	1908.	1909.	1910.	1911.	1912.	Total.
Number of patients admitted	102	196	158	198	84	738
,, tuberculous	80	193	156	194	84	707
,, other than tuberculous	22	3	2	4	*nil*	31
,, discharged	3	99	142	194	82	520
,, tuberculous discharged	2	77	139	190	81	489
,, other than tuberculous discharged	1	22	3	4	1	31
,, tuberculous apparently cured	2	68	133	174	78	455
,, tuberculous who died	*nil*	*nil*	*nil*	6	2	8
,, tuberculous not improved	*nil*	6	6	4	*nil*	16
,, transferred to other hospitals or removed by parents before treatment completed	*nil*	3	*nil*	6	1	10
,, of recurrences readmitted	*nil*	*nil*	1	4	5	10

Aspirations performed during 1911.

	Ankle.	Spine.	Hip.	Knee.	Shoulder.	Other.	Total.
Total	3	147	217	69	15	32	483
Averages	3	4·2	6·6	5·3	5	2·3	4·6

Average Duration of Stay.

Tuberculous disease of hip	553 days.
,, ,, of spine	441 ,,
,, ,, of knee	351 ,,
,, ,, of ankle	298 ,,
,, ,, multiple	256 ,,
,, ,, other	174 ,,
,, ,, of shoulder	168 ,,
Average stay each patient	320·15 days.

DISCUSSION.

The discussion opened under the chairmanship of Dr. R. W. Philip, Edinburgh.

Dr. David A. Stewart (Representative of the Canadian Government and of the Canadian Association for the Prevention of Consumption) had no idea of trying to give them any account of what was being done in Canada, but merely joined as a member of the Conference in making a few remarks about some of the papers that had been presented. He might say at the outset, following Dr. Gauvain's excellent presentation of his work, that he had had the good fortune to visit his institution, and had never received anything like the same benefit from institutions on the American side. Yesterday the very excellent and very proper idea was expressed that children who were not handicapped by having tuberculosis should not be denied the privilege of having better and more open schools than at present. He would like to suggest that the same line of thought might be carried out in connection with hospitals. Their hospitals were built years and years ago—many of them—and he did not see why the same idea should not be carried out at least to some extent in them. In all their hospitals—particularly in the surgical wards—they had a great many people who had active or latent tuberculosis, and all sick people, in the time of lessened vitality, were more subject to the possible progress of this disease than at other times. He thought the architects of the hospitals, as well as the school architects, might be educated on the lines of open-air construction more than at present. Something had been said with regard to hygiene in schools. He thought that beyond the teaching of hygiene in schools, a marked improvement might be made in the method of teaching, at least on his side of the Atlantic. He had known children who had left school with a wonderful knowledge of the muscles and bones of the human anatomy, but knowing nothing about germ-carrying in disease. It seemed to him that a school should be constructed in such a way that not only the children were not harmed by attending it, but that it should be a model in all hygienic respects. Hygiene might be taught with the school as a model, as was done in some places. The children were trained as in a good home, in the best habits of living, and the school might be taken as a model for houses in general.

A number of references had been made to out-door and open-air life, and the well-known necessity of it in cases of tuberculosis. There were still to be found—at least on his side of the Atlantic—some people who were very much afraid of the fresh air, especially in winter time. His work in this campaign lay in the west of Canada, which, as they knew, was rather a cold country in winter, and he found that it was quite possible to keep people out of doors by day and even by night in the very coldest weather of Western Canada. He could not say it was always beneficial, but he could say that even in the very cold weather of last winter he found it was not possible to get the patients to sleep indoors. They had been accustomed to out-of-doors, and even during three weeks when the thermometer did not rise above zero, they insisted on sleeping out of doors just the same.

Reference was made yesterday to sending patients to the country. He would like to raise the point that while it might be quite proper and right to send them in what was called the pre-tuberculous state to the country to be out among the flowers and grass, it seemed to him that when any patient, young or old, was definitely ill, merely to send him to the country was not always a proper thing. It seemed to him that while "fresh air," "good food" and "rest" were supposed to be the three big words in the treatment of tuberculosis, the biggest word of all possibly was "regulation." These patients needed proper instruction—and proper instruction constantly. That should be kept prominently in view wherever a patient was. The important thing was what a patient did and not so much where he was living. It might be necessary to raise the point that the mere sending of a patient to what were supposed to be better surroundings or a better climate might not always result in benefit, but that in country or city they should be kept under regulation.

It had been the custom in England and Scotland among some medical practitioners to advise patients with tuberculosis in a general way to go to Canada. Of course he thought it possible that they had a climate which was more suitable for the treatment of tuberculosis than that of this country. But they believed that climate at its very best—even removal from the very worst to the very best—meant a gain of only 10 or 15 per cent. at the most, and they believed very firmly that the great point with a tuberculous patient was not where to go but what to do and what conditions to live under. To send a man without means to

Canada, even supposing he would not be excluded as suffering from tuberculous disease, to meet strange conditions and to face the necessity of making his living, a man who, on account of lack of means, or having only small means, would be placed in uncomfortable surroundings, was to send him, not from bad to better, but distinctly from bad to worse. There could not, he thought, be a worse policy than to send any tuberculous patient out into unknown conditions. Send him to known conditions wherever they sent him, but not to unknown or untried conditions.

Speaking of his own work and the patients he had under his care he should say roughly—without being able to analyse the figures there—that possibly one third of the patients sent to the institution he had charge of were people from Great Britain who had come out to Canada on account of tubercular disease. Needless to say, they did the very best they could for them, and sometimes set them on their feet; but they could have done just as well, and in many cases a great deal better, had they been cared for at home and possibly sent to Canada with sufficient means to give them a start. Let him say again that to send patients out into the unknown conditions of a new country, insufficiently supplied with money or means, was rather cruelty than kindness, and the mere accident of sending them to a climate which was supposed to be better was not in any way a compensation for sending them out to bad or unknown conditions. He thought he might add the experience of their work in Canada to what he had no doubt was the experience in connection with the work here, that one of the cardinal points in the treatment of the tubercular patient was the day on which he left the sanatorium to return to his home conditions. It seemed to him that no tubercular patient was merely a patient. Every tubercular patient was a bundle of problems, and they had not done their duty by him when they had merely advised him. They had not even done their duty by him when they had brought him back to a condition of fair health. Possibly one of the most important things left for them to do was to get him somehow or other a start under conditions which would not exhaust him, but in which he would be able to continue to improve. And it seemed to him that they had not, as physicians, done their duty by the tubercular patient until they had gone over with him every detail of his circumstances, advised him as best they could, and secured the help for him that was necessary. He might be permitted to bring the greetings of the National Association of Canada to the National Association of Great Britain, and he assured them that personally it had been a very great pleasure to him to attend the meetings there.

Dr. Ransome, F.R.S., wanted especially now to speak on a subject of extreme importance, and that was more fresh air for the workers. He had entire sympathy for all that was said about providing schools, hospitals, and other places with more air, but he thought people hardly realised how terribly the people in their work-places were now being handicapped by having to work in foul air. It was a good many years since he read a paper on foul air and lung disease. It was one of the lectures given for the Manchester and Salford Sanitary Association, which was the real pioneer in this movement against tuberculosis. He called attention there to the evil effects of foul air, but, he was sorry to say, with comparatively little effect until he was put on a Home Office Committee along with other old townsmen, Sir William Roberts and Sir Henry Roscoe. They were all put on from Manchester, and their duty was to inquire into the causes of the unrest that was then prevailing in the humidified weaving sheds in that district. They found there were real grounds for some of the complaints that were made, but the real mischief was being done, not by the vapour which was set abroad in the sheds, though the poor people thought they were being boiled to death. That was not so. But they had a real grievance, which they did not know of, in the foul condition of the air, and also in the foul condition of the water from which the vapour was made.

The Committee drew up certain standards of ventilation, and also certain regulations for preventing the evil of bad water being used, and also dealing with the dampness of clothes. But the important thing was that for the first time a standard of ventilation was set up. They ventured to suggest to the Home Office that in these humidified sheds only nine parts of carbonic acid per 10,000 of air should be allowed. It was quite easy to ascertain this quantity.

Their proposals were adopted, and this standard was set up of nine parts of carbonic acid to 10,000 of air. He was glad to say that the result was exceedingly good. As a professor of public health he might say that improved ventilation was never found without improvement of health. It followed in this case as a sort of natural consequence that there was less sickness in the sheds, and fewer cases of consumption in the next two or three years. Yet, in spite of the regulations being accepted by both work-people and employers, the Home Office had again appointed a Committee, and they had reported that a retrograde step should be taken—that instead of nine parts of carbonic acid per 10,000 of air, eleven parts should be allowed—and, still more serious, that the organic particles that would be swept away by the additional ventilation required for the old standard should be allowed to remain in the workshops. He wanted this Association to set its face strongly against such a retrograde step. He made up his mind, old though he was, that he would take the first public opportunity of stating these facts. They would find that the regulations had been issued by the Home Office allowing this additional foulness of the air, and he thought this great Association ought to protest against it.

Dr. Ransome then moved the following resolution on the subject introduced by him: "**That this Association for the Prevention of Tuberculosis, now assembled in conference, desires to protest against any lowering of the standard of ventilation in any of the work-places of the Kingdom,**" saying he put it in this general form because, although so far the standard had only been applied in the humidified weaving sheds, the new regulations would be applied throughout the country. But he could say that the ventilation in other work-places required to be improved just as much as in the humidified sheds. Accordingly the resolution suggested that the standard should not be lowered in any of the work-places of the Kingdom.

The CHAIRMAN seconded the resolution, and suggested the addition that a copy of the resolution be sent to the Home Office.

The resolution was put from the chair and carried unanimously.

Dr. KINTON (Mount Vernon Sanatorium, Northwood) took the opportunity of thanking Dr. Last for his very admirable paper. As he pointed out there were still a great many people—a great many medical men—under the impression that chronic pulmonary tuberculosis in children was rare. He had had the opportunity at Mount Vernon Sanatorium of treating several hundreds of children during the past eight years, and he cordially agreed with everything Dr. Last had said about the frequency with which one found this condition. Also he thought it very important that the treatment of the so-called trivial case should not be overlooked. At Northwood there was not the opportunity of keeping the patients so long as Dr. Last was able to do. He saw a number of these so-called trivial cases in which there were very few signs—just altered breath-sounds or something like that. They came there and were treated for a short time, and their recuperative power being wonderful, a very great change was brought about. But as they could be kept only for a short time they went back again to their own homes and their own schools, into conditions which were probably bad. Many of these cases came back in a year or two when the signs were no longer doubtful, and all hope of making those children permanently well had then disappeared. This showed the great importance of taking the children early, and giving them the best chance they could at that time. The percentage of cavity cases was very striking. He was quite confident that anyone who had had to do with the treatment of children was very much struck by the number of cavity cases which came in for treatment. He was not convinced that all the cavities were really excavation due to tuberculosis. Many of them came from other diseases—broncho-pneumonia, perhaps called bronchitis—and the children with these lesions living in homes which were infected, of course these cavities were very suitable for the growth of the tubercle bacillus.

One point in his experience was the great value of the dispensary system. Children returned to conditions at home which were bad, and unfortunately his hospital, not having a dispensary, did not follow them later. The result was that the children who had really done quite well would in another year, or perhaps eighteen months, lose all the benefit. It seemed to him rather a wasteful form of expenditure, and he was quite sure that this movement for the dispensary system—a very important part of which was to follow the children home and make certain they would have proper conditions and be well cared for—was one of the most important things in the new development of the treatment of consumptive children. The inadvisability of speaking of "cured" cases he quite agreed with. He was glad that Dr. Last emphasised that; he very much preferred to use the term "arrested." He found that if he told the parents of children that they were "cured," they thought the children could be taken back home and treated without any care. But if they were told the disease was "arrested," they understood that they had to exercise greater care than if they were told the child was "cured."

He should like to say that sending people to the country for a short change had in his experience proved disastrous. Quite a large number of the cases they got were people who had been sent by their doctors to the country, and when one inquired how they spent their time, one found that they had been doing all the things they should not and none of the things they should have done. And this applied particularly to children. He saw quite a large number of children who had been sent away to the country in this fashion, and with disastrous results. There was also the other point, that those children who came to the sanatorium proved to be very useful messengers of the gospel which they preached. One constantly heard ministers of religion speak of the value of children in propagating what they had to proclaim, and he had been very much struck with the influence of an intelligent child after leaving the sanatorium. In fact he thought probably the best messengers were children. The adults very frequently had much else to occupy their attention and foolishly forgot some of the things they had been told. But a child was more impressionable, and if for that reason only—not the most important—he agreed that children should be admitted to the sanatorium.

He had unfortunately a little time ago a very striking instance of the difficulty of diagnosis in the case of children, which was very much more marked in the early cases. A child was brought in, and he asked a large number of experts to examine it, doctors belonging to their own institution and others. He was assured by everyone that there was no pulmonary tuberculosis. Unfortunately nothing that they could do helped the child, and they had a post-mortem examination. He was then able to demonstrate that both lungs were extensively diseased. And yet there was very little sign that this was so. The child was delicate and weak—obviously tuberculous—but if a rigid exclusion had been practised that child would never have got into the sanatorium at all.

Mr. T. C. Horsfall (Manchester) must for a moment advert to the address of the Lord Mayor of Manchester. In referring to the work done in Manchester against tuberculosis the Lord Mayor omitted to mention the Manchester and Salford Sanitary Association, to which Professor Ransome had referred. It was of real practical importance to-day that the work of that Society should not be forgotten. It still existed, and the need for its work still existed, and every year it had less support. People—prosperous citizens—left the town and forgot the sufferings of the people of Manchester because they were out of sight and therefore out of mind. Might he give them an idea of the character of the Association? Dr. Ransome was for many years the chairman of the Committee, and he made their Association not only of extreme importance to Manchester, but, he was quite sure, of importance all over Great Britain. Its work was to publish weekly returns for about twenty years giving statistics of the prevalence of phthisis. They published also a very large number of papers by authorities like Professor Ransome and Professor Delépine. They also re-published important articles from 'The Lancet,' and made known the proceedings of the congresses in Paris and elsewhere. And when he told them that they had only a beggarly income of £80 a year they would see that Manchester, although it had done much good work, left some work unsupported. He hoped that one of the results of holding this Conference there this year would be that more of their leading citizens would feel that it was one of their elementary duties to support this Society. He thought the most important lesson they had to learn might be clearly deduced from the admirable paper of Dr. Last. The lesson he learned was that every child must be considered as potentially a tubercular case. He would add that each child was also potentially a drunkard, and they must begin from the first to counteract the tendencies to tuberculosis and the excessive use of alcohol. Mrs. Sweeney's paper showed how possible it was to take right action with regard to these things. If in towns like Manchester they would only purify the air as fully as they knew how, they could have the open-air system much more largely in all their schools. He would give examples of the useful action that is within reach of every municipal authority. Germany, as they knew, had suffered a great deal more from phthisis than they did. The cause obviously was that in the cities there the people were much worse housed than here. They lived in tall, badly ventilated houses. In winter they had to depend for heating upon the closed stove, so that their houses were very badly ventilated. The result was that phthisis had been a fearful plague in Germany. They had found it necessary to pay a great deal more attention to physical training than in this country. They had now made three hours of gymnastic training compulsory in all their elementary schools. But they had found that three hours of gymnastic training was not enough to protect children against the attacks of tuberculosis and other diseases, and had passed an Act giving every town council the right to have one afternoon a week for compulsory games for the children of the elementary schools. The Germans were a practical people. They knew that it was not enough simply to give open spaces; they had set to work and had trained 60,000 teachers to be leaders of games, giving them a slight addition to their salaries. One of the towns which adopted the Act was Pforzheim in Baden, a manufacturing town which was saturated with foul air and other bad conditions of manufacturing towns. The rate of illness among the school-children was increasing steadily year by year before this Act was adopted. But in the year of the adoption of the Act the children's attendance was increased by 10,000 hours.

A book had been published lately by a school teacher, head of an elementary school in Germany, showing that 200 children taken for six days' walking under very careful conditions, and weighed before going off on the expedition, went on steadily increasing in weight and in height for three months—and no doubt much longer—to a far greater extent than a large number of children who had spent an equal time in the country, but without systematic exercise.

Dr. C. Killick Millard (Medical Officer of Health, Leicester) thought they would all be agreed as to the great value of the contributions this morning to the subject of tuberculosis in childhood. To Mrs. Sweeney, Dr. Last and Dr. Gauvain they were very much indebted. He wanted to emphasise the importance of dealing with tuberculosis in childhood. The whole problem of dealing with tuberculosis was, of course, just now in the melting-pot, and it was very important that all aspects of it should be carefully considered. He was quite satisfied that the question would eventually turn out to be very largely one of pounds, shillings, and pence, and as regards insured persons, for whom a certain amount of money would be set aside, a great deal more would be done in the near future than in the past. But as regards children, not insured persons, there was a danger that their claims would be overlooked. They had heard of the excellent efforts being made in certain places, to a limited extent, for children, but of course they must remember that in the great majority of towns and localities very little was being done as regards tuberculosis in childhood. Crippled children were cases which could be dealt with best in special institutions, such as Lord Mayor Treloar's Homes, because the actual number of crippled children in any one community was not very large.

The question of the existence of tuberculosis in childhood was a very difficult one. Dr. Last said he kept his cases from a year to eighteen months, and three months after all physical signs had disappeared. That was a very long period, and meant very great expense, especially in the case of children who had no very evident signs of disease to begin with. The money would be spent to the best advantage in the case of open-air schools. This was a very economical way of dealing with the question. He wanted to emphasise their value. They must extend the principle, as far as possible, to all schools. It was, undoubtedly, one of the chief advantages from these schools that they served as object-lessons to other schools. That was being already seen in the town from which he came. He had recommended that in all schools, when the weather was suitable, some of the classes should be held every day out of doors as far as possible. Two experiments were tried last year in Leicester. For many years the sanitary committee had been reserving a number of beds in their isolation hospital for adult consumptive patients, and this year twenty-five beds were set aside for tuberculosis in childhood. They were brought face to face with the difficulty of determining what cases were tuberculous. Therefore they accepted pre-tuberculous cases, and did not commit themselves to a positive diagnosis of consumption. The results were most satisfactory, and they had no trouble as regards cross-infection. They had in Leicester a voluntary association, which erected buildings on the Lincolnshire coast. The Leicester Education Committee obtained the use of them in the autumn, and sent to them a number of their school-children—selected as being in delicate health—for a period of two or three months. The results were again most excellent. He mentioned that as showing what might be done at comparatively little expense in dealing with the question of tuberculosis in childhood.

SECTION II.

THE POWERS AND DUTIES OF SANITARY AUTHORITIES AND THE WORKING OF THE NATIONAL INSURANCE ACT IN CONNECTION WITH TUBERCULOSIS.

AFTERNOON SESSION, JUNE 6th,

AND

MORNING SESSION, JUNE 7th.

Chairman: DR. R. W. PHILIP, F.R.C.P.E., F.R.S.E.

WORK OF THE LOCAL AUTHORITIES UNDER THE INSURANCE ACT.

By W. LESLIE MACKENZIE M.A., M.D., LL.D.,
Medical Member of the Local Government Board for Scotland.

(1) Last year I placed before the Conference some provisional considerations on the work of the public health authorities in the management of tuberculosis. Then the Insurance Act was still under discussion as a Bill; now it is under discussion as an Act. But the difference between a Bill and an Act marks the difference between the discussion of then and now. Then we were in a position to suggest alterations; now it is simply our duty to understand how the law is to be administered.

(2) Let me say that my apology for continuing the discussion from last year to this is that I could not lose an opportunity of expressing my appreciation of the work of Dr. James Niven, Medical Officer of Health of Manchester. Year in, year out, for a long series of years, Dr. Niven has directed the public health administration of this great city into the multitudinous by-ways

frequented by the most subtle and treacherous disease of the Western world. Year in, year out, he has presented in volumes of scientific facts the intricate relationships of tuberculosis to the social life of his community. Case after case he has investigated with unfailing patience and unfailing scientific scrutiny. By the accumulation of concrete facts he has driven home on our minds in a way that few men in Europe have done the seriousness of the problem of tuberculosis infectivity, the difficulties of getting to close quarters with actual histories, the immense scope of the hygienic activities necessary to meet the attack of an enemy so powerful, and the need for a total view of the civic campaign against disease-producing conditions. I could not open a discussion on the greatest hygienic question of the hour without first paying homage to an eminent scientific administrator.

(3) This is to be a discussion by many men, not a prelection by one. Accordingly, I put the points as questions. If there is no answer to them all, they are at least worth discussing.

(4) Out of what fundamental conception in the Insurance Act does any new duty arise for the local and the central authorities?

In regard to tuberculosis the fundamental concept is "sanatorium benefit." This term covers every form of treatment applicable to tuberculosis. It covers treatment in institutions, whether they be sanatoria (in the narrow sense), or tuberculosis hospitals, or tuberculosis dispensaries, or convalescent homes, or open-air schools, or rural or sea-side homes for tuberculous children, or work-colonies, or night-camps, or day-camps, or any other form of institution. It also covers every form of home treatment, whether under the care of the private practitioner, or under the general direction of a medical officer of health, or in other of the many forms that domiciliary superintendence of treatment may assume. It covers, in a word, all the forms of specialised treatment capable of being applied in any one of these many ways. It follows that we must ask another question:

(5) What is "sanatorium treatment"?

In the Interim Report of the Departmental Committee on Tuberculosis you will find (p. 9) an important series of paragraphs on the nature of "sanatorium treatment." There we read—"The principles of treatment which have been elaborated for the most part in sanatoria have a wide application outside these special institutions. . . . Under suitable conditions, especially if the treatment is being carried out under the advice of a medical man with special knowledge of modern methods, home treatment may be, in all essentials, sanatorium treatment."

This is a point for discussion, and the discussion is important. To what extent may we expect, in the houses of city or country, to secure such conditions as may legitimately be held to make "sanatorium treatment" possible at home? Last year I directed your attention to the problem of the over-crowded one- and two-roomed houses. What I said then, I may repeat now. To attempt to treat any form of tuberculosis in the overcrowded one- and two-roomed houses is to trifle with the known factors in the spread of the disease. Since that opinion was expressed, the Local Government Board for Scotland have published in one volume a series of three reports on the actual conditions found in one great Scottish city. These conditions, as you may find if you glance at the reports, are not confined to this one city. On the contrary, it is probable that not a single industrial city in this country can be found where, in one degree or another, these staggering facts cannot be paralleled. A few years ago the Charity Organisation Society, Edinburgh, published an analysis of the home life of 781 families in a certain quarter of Edinburgh. As a piece of social investigation this analysis remains, I believe, unique for its thoroughness. It has, perhaps, been made the basis of somewhat doubtful conclusions; but of one conclusion it was from the beginning a complete proof, namely, that with every qualification and with every extenuation, the one-roomed house is almost never a suitable place for the treatment of tuberculosis, and the two-roomed house but very rarely. Yet it is in one- and two-roomed houses that a vast proportion of our industrial workers live. Can we, therefore, say that "sanatorium treatment" at home is likely to constitute, on any great scale, an effective method for the prevention of tuberculosis?

That much can be done, even in the one-roomed house, no one doubts; but let us, by concrete and detailed examination, get to close quarters with the actualities. Whatever be the improvements in therapeutic methods, whatever hopes the intensive or fractional use of tuberculin may justify, shall we be able to say with any authority that houses unfit for healthy people are fitted to afford "sanatorium treatment" for the tuberculous? Here I do not dogmatise; I fling down the questions for discussion, and I am prepared to be persuaded when the counter-evidence to these two reports is forthcoming. It is not enough to say that this biological investigation in the eastern city, supplemented by the pathological investigation in the western city, proves that the decline in the tuberculous death-rate must be regarded as an affair of "natural history." That brings no consolation; it leaves the administrator unconvinced. Even if we accept the further proposition that the vast majority of our people, even up to 80 and 90 per cent., have, at some period of their lives, suffered in one degree or another from tuberculosis, we are no further forward. We are still faced with the question, Why are the cures more numerous and the severe cases less numerous in the good quarters than they are in the bad quarters? If the severe cases rise when the occasions for infection are greatest, and fall when the occasions for infection are least, is it not worth while to go on searching among the actualities for the special causes operative in the one case and not operative in the other?

There I leave the question for discussion.

(6) These are questions of practical theory. Let us look at the new Act. What are the powers and duties of the central authority for public health—that is, the Local Government Board? They are briefly these:

Under the National Insurance Act it is the duty of the Board—

(*a*) To approve sanatoria and other institutions for the treatment of tuberculosis under the management of persons or Local Authorities other than Poor-Law authorities (Section 16);

(*b*) To approve the manner of treatment when such treatment is provided by persons or local authorities other than Poor-Law authorities, otherwise than in sanatoria or other institutions, and to authorise local authorities to provide such treatment, including the appointment of officers for the purpose (Section 16);

(*c*) To distribute to county councils, town councils, and other local authorities and persons, with the consent of the Treasury, sums made available for the provision of, or making grants in aid to, sanatoria and other institutions for the treatment of tuberculosis (Section 64 [1]).

Let it be remembered that "an insured person shall not be entitled to sanatorium benefit unless the insurance committee recommends the case for such benefit." This is a fundamental power, and must have a determining effect on the work of the local authorities. For the insurance committee has power to extend sanatorium benefit to the dependants of insured persons. If the money available from the Insurance Fund is not sufficient to confer sanatorium treatment, in the wide sense, on insured persons and their dependants, the insurance committees, through the Insurance Commissioners, may indicate, in an estimate, what amount of money they consider necessary and how much they themselves have available. The public health authority, if they approve this estimate, thereby become liable for half of the difference between the amount available from the insurance fund and the total amount required. For the other half of the difference the Treasury becomes liable. Put otherwise, the public health authority, if it spends £100 on the treatment of insured persons and their dependants, will receive from the Treasury another £100. Substantially, this is a grant-in-aid to the public health authority.

(7) What are the new powers and duties of the local authorities for public health?

Under the National Insurance Act, local authorities (including county councils if authorised) have power—

(*a*) To provide treatment in sanatoria and other institutions for insured persons resident within and without their area (Section 16).

(*b*) To provide treatment for the dependants of insured persons resident within their area (Section 17).

(*c*) To undertake, if so authorised by the Board, treatment, including the appointment of officers for the purpose, of insured persons and their dependants otherwise than in sanatoria or other institutions (Sections 16 and 17).

(*d*) To combine for the purpose of providing sanatoria and other institutions.

(8) Here, then, in the additional powers of the central and the local authorities, we have an enormous extension of duties. It is true that, in set terms, the new powers refer only to insured persons and their dependants; but, in one important clause, the powers are not thus limited. You observe that, under Section 64, the sum for provision of grants-in-aid to sanatoria and other institutions approved by the Local Government Board includes both insured and uninsured. The sum available is one and a half millions. Obviously the public health authorities, having already their great armament of public health resources, are expected to develop them along the lines most likely to assist the special purposes of the Insurance Act. In doing so the local authorities are equally fulfilling the purposes of the Public Health Act. This large Imperial grant is an important supplement to the local rate; but it is obviously a supplement, not a substitute. It follows that even if we add together this grant and the large sum that forms the sanatorium fund, we shall still have left a great deal of outlay for the public health authority as such. But the important point is that the additional powers conferred on the public health authorities make it possible for them more adequately to fulfil the primary purposes of the Insurance Act, namely, the institutional and non-institutional treatment of the multitude of patients.

This point needs to be emphasised, because it has been suggested that the primary duty of a public health authority is prevention, not treatment. In the face of the specific powers of the Insurance Act, namely, that the local authorities are themselves empowered to provide sanatoria and other institutions, to undertake also non-institutional treatment and to appoint officers for the purpose, this contention has no longer any basis in the statutes. Indeed, so far as I can discover, it never had any basis in the Public Health Acts either of England or of Scotland. A moment's reflection shows that the distinction between so-called prevention and so-called treatment is an illegitimate abstraction. Treatment is a mode of prevention; it is a necessary mode of prevention; it is a statutory mode of prevention. Under the Public Health Acts this has always been so. For my part, I do not understand why, in such a disease as tuberculosis, treatment and prevention should ever be separated. Except for the fact that confused thinking dies hard, I should not now be discussing the distinction at all. At any rate, whatever basis it had before 1912, it has none now.

(9) What now of the uninsured persons?

Obviously, from the outline I have given it is possible to make one inference, namely, that by a combination of the powers of the Public Health Acts and the added powers of the Insurance Act, the public health authorities are now in a better position to prepare a scheme of treatment and prevention for the community as a whole. This inference is made prominent in the Departmental Committee's Report, in which we read: "Any scheme which is to form the basis of an attempt to deal with the problem of tuberculosis should provide that it should be available for the whole community."

That proposition will, I think, commend itself to everyone as the dictate of common-sense.

But it still remains to ask the question—What is the position of the uninsured tuberculous patient? Is he to be left until he is incapable of providing any treatment for himself and then handed over to the Poor Law or to the charitable organisations? If what I have said be sound, surely this cannot be the correct course. Of the English Public Health Acts I speak with reserve, because experience has not made me familiar with them; but I understand that, in England as in Scotland, it is the duty of the public health authority, not only to take every measure to destroy the conditions that favour infection, but also to treat the individual patient wherever he is—and that is everywhere—a present or potential source of danger to his fellows. It is, therefore, impossible to restrict treatment in the narrow sense to insured persons and their dependants. The uninsured, as they benefit by every improvement in the environment, whether it be the destruction of bad houses, or the provision of good houses, or the stopping of tuberculous milk, should equally benefit by all the measures applicable to an infectious disease—treatment in hospital, treatment at home, treatment by general drugs, treatment by specific drugs, in a word, treatment on the same general lines as are now definitely figured out for the insured.

(10) Does tuberculosis include anything but pulmonary tuberculosis?

The Insurance Act speaks only of "tuberculosis." It may be assumed that the statutory term covers all that is intended by the medical term. Pulmonary tuberculosis is, of course, the immediately urgent question; but, as the Interim Report of the Departmental Committee shows, non-pulmonary tuberculosis must also be faced. Here the local authorities enter on a relatively new field. But their duties are equally explicit. Whatever has been said of tuberculosis in general applies equally to the pulmonary and to the non-pulmonary forms. Note that wherever the Act speaks of sanatoria, it speaks also of "other institutions." Further, whatever powers of treatment the local authorities have for the one form of the disease they have for the other forms of the disease. Pulmonary tuberculosis has assumed so large a place in our consciousness simply because the invasion of the lungs leads to more rapid disablement than the invasion of the glands or the bones; but at no point from the commencement of infection in the mouth, in the throat, in the bowel, in a gland or in a bone until the fatal issue in abscesses or cavities, can we say that tuberculosis of the lungs is separable from tuberculosis of the other tissues. It may be—but the point needs much more investigation than it seems yet to have received—that a patient suffering from tubercular discharges of the glands or bones or joints is less capable of spreading infection than a patient suffering from a cavity in the lungs; but the difference is not a difference in kind; it is simply a difference in degree. But whatever be the infectious potential in an individual case, the duties of the health authorities are unmistakable. The non-pulmonary forms of tuberculosis are frequently "contacts" of the pulmonary forms; very frequently—so the evidence inclines us to believe—they are the result of direct infection from tuberculous milk. If a case of typhoid arose from a milk infected with typhoid germs, we should not, on that account, think it less worthy of treatment than if the origin of the infection had been another typhoid patient. Why should we apply a different clinical test to tuberculosis?

The practical problem, therefore, for discussion is this—What form of provision is it most urgent for the local authorities to make for the treatment of non-pulmonary tuberculosis? Shall it be begun with an effort to staunch the stream of cases that flow from the great epidemics of measles, whooping-cough, mumps, and the other infections of childhood? Should the local authorities appoint men specially qualified to investigate the effect of measles and whooping-cough in creating the predisposition to contract tuberculosis? If by the ordinary methods of notification and isolation they are unable to prevent these great epidemics among children, should they or should they not set themselves to collect the inevitable aftermath of tubercular glands? Should they or should they not set themselves to provide open-air institutions, open-air schools, and holiday homes for the children suffering from adenoids, or enlarged glands of the neck, or anæmia, or mal-nutrition in its many forms? These are problems that vary in their urgency; but can any student of tuberculosis say that they are not pressing or that their detailed consideration would not be profitable? Surely, if the full benefits of the Insurance Act are to be secured at the age of sixteen, it is essential that the child should be protected from the age of one.

Whatever be our theory of the relation of bovine tuberculosis and human tuberculosis, this at least is established—that bovine tuberculosis does infect the human infant. If a minor infection in early life does, as is probable, confer some degree of immunity in later life, it is none the less certain that masses of children die because the dose of bovine tuberculosis is too great. If, then, it be the duty of the local authorities to treat the early case of pulmonary tuberculosis, whatever the origin may be, is it not equally their duty to treat the early non-pulmonary case whatever its origin may be? Here the inspection of school-children and the work of the local authorities merge once more into a single system of treatment and prevention—or rather of prevention, first, by treatment of the environment, and second, by treatment of the individual.

(11) In the light of the statutory powers and duties, consider for a moment the schemes of prevention suggested.

The pre-supposition of every scheme of treatment is that anything done for the individual can achieve its best result only when he is treated in relation to the whole social conditions. At no point in the treatment of a case can the work of the public health authority be legitimately slackened.

What, then, are the steps in applying the social resources to the treatment of individual cases?

First, it is necessary to collect cases. For this many suggestions have been made. To compulsory notification is now added the notification necessary through the local insurance committees. The departmental committee suggests that the simplest method of organised collection of cases is some form of dispensary. What form a dispensary should take is a matter for debate; but no form equally fits every locality. One public health authority prefers to work from a tuberculosis hospital as the base; another prefers an outdoor department of a general hospital as the base; another prefers an independent dispensary as the base. The departmental committee makes allowance for every variety of administration; but you will note that it emphasises the desirability of having a dispensary associated with observation beds. The ground of this suggestion is that it is, in many cases, not possible to determine without prolonged observation what ultimate form of treatment is best for the individual patient. We must, therefore, guard against taking the term "dispensary" in too specialised a sense. Many maintain that treatment by tuberculin can be safely conducted without hospital beds or even without observational beds. Others dispute these propositions. All are agreed that beds are an advantage.

Here, therefore, is a fair problem for discussion:

(i) What is the best form of collecting the cases?

(ii) How far can the latest forms of treatment be administered in an out-patient department of a tuberculosis hospital, or in an independent dispensary?

(iii) What is the best basis to start from: A hospital where a few weeks of education and preliminary treatment may be given, with after-treatment at an outdoor department or dispensary; or a dispensary, where the whole treatment must be conducted without other accommodation than is available at the dispensary or at home?

Obviously, the answer to these alternatives depends on the possible classification of cases. What classification of cases will enable us to advise local authorities what is the best proportion of hospital beds to provide? What seems quite certain is that no simple classification into "early" cases suitable for sanatorium treatment, "middle" cases suitable for home treatment, and "advanced" cases requiring isolation, can be regarded as an adequate analysis of the facts. It is admitted that the clinical distinction between an early case and a middle case is a shifting line, and no one seems quite certain, in any individual case, at what stage it should be declared an advanced case. For my part I could not base a distinction of institutions on clinical distinctions so various and disputable. The facts certainly seem to require distinctions much more intimate and much more subtle before we can legitimately say that this proportion of cases can be adequately treated at a dispensary, and that proportion of cases requires treatment in a hospital or sanatorium. The one practical problem, however, does admit of discussion, namely, whether the best practical basis to work from is a tuberculosis hospital or a tuberculosis dispensary. Undoubtedly, the educative treatment in hospital, even for short periods, is, quite apart from the special administration of tuberculin or other drugs, a great factor in the prevention of the disease. Can we, in the light of the facts about housing as revealed in the reports I have named, legitimately say that the primary superintendence of cases at home under the direction of a tuberculosis officer or dispensary is better, or in the long run cheaper, than the primary superintendence and education for a short period in a tuberculosis hospital? Personally, I incline to regard the preliminary education in a hospital or other institution as a better starting-point for treatment in a very large proportion of cases. In the extremely advanced cases of the disease where the danger to others is blatant and unmistakable, there is no difference of opinion possible.

Second, given an adequate method of collection, what institutions are necessary?

Are we to separate the sanatorium for so-called early cases from the tuberculosis hospital for cases whose after-history we cannot reasonably forecast? Or shall we proceed from the other end and say that the tuberculosis hospital should be available for all cases suffering from acute febrile symptoms, with suitable isolation for the dangerously infective, and that, from among these patients, as the fever subsides, we should select those most likely to benefit from sanatorium treatment? This method would avoid one grave administrative defect, namely, the concentration of the worst cases in hospitals for the hopeless. The hopefulness even of advanced cases is a well-known phenomenon. It seems administratively preferable to work from a basis of hopefulness towards greater hopefulness than to work from hopefulness backwards towards despair. Knowing what we know of the construction of modern isolation hospitals, we can provide pavilions for every grade of infectivity. It seems reasonable to suggest that as almost every patient, however acute his fever, benefits in some degree from a period of hospital treatment, we should have, in a tuberculosis hospital for all orders of acute cases, a better chance of discovering what patients can be ultimately promoted to the higher grades of sanatorium treatment than if we worked simply from observations at an outdoor department or at home. This method, no doubt, is for the moment more expensive; but it has never, so far as I am aware, been put fully to the test in this country. At any rate, to such local authorities as have the resources, it should be open to consider whether their ultimate interest does not lie along the lines of preliminary treatment of all cases for a short period either in observational or in other hospital beds.

(12) On the special administrative aspects of tuberculin I leave others to speak. This is more a clinical matter than an administrative matter, but obviously it deserves careful consideration from the administrative side. Recent discussion seems to leave the problem among the unsolved. Nothing but careful research can determine for us what is the best course to take; but there seems to be sufficient clinical ground to justify the local authorities in counting the tuberculin treatment as a form of treatment to be provided for. Whether it needs or does not need greater or less provision of beds is a matter that I leave to the clinicians.

(13) In this outline I have tried to keep to the questions that demand a practical answer. In the circular just issued by the Local Government Board for Scotland, which corresponds with the circular issued by the English Local Government Board, an effort is made to place before the public health authorities the lines along which they should consider the preparation of their schemes. Substantially, what I have placed before you contains the practical and provisional conclusions of the Departmental Committee's report; but I have emphasised the points that have been forced on our attention in Scotland by the last six years of administrative experience. From evidence before the Local Government Board for Scotland, we know that the local authorities both of town and county are wide awake to the possibilities opened up by the new powers, and are rapidly preparing for a great extension of their activities. From all I can learn of England, the English authorities are equally alert. Naturally, as concerned in the whole work of public health administration, I am against the sectarian tendency that would dissociate tuberculosis from the general work of public health administration. In Scotland, the declared administrative policy has been to keep tuberculosis in line with all other infectious diseases, and so maintain unity of administrative purpose.

THE POWERS AND DUTIES OF SANITARY AUTHORITIES, AND THE WORKING OF THE NATIONAL INSURANCE ACT IN CONNECTION WITH TUBERCULOSIS.

By COUNCILLOR ARTHUR NEAL.

A word of explanation, if not of apology, as to why I occupy my present position. Looking through the agenda of the Conference I find that I am the only person named upon it who may not claim to be an expert upon this particular subject. Our Medical Officer of Health in Sheffield, whose work is known beyond the limits of Sheffield was asked to undertake this duty; but he was otherwise engaged, and he made the suggestion that I, having had some experience of the administration of the work of dealing with consumption in Sheffield, should take the present position. I was asked by your Honorary Secretary to write a paper, but I have not attempted that. I thought, intervening in the middle of the debate or discussion, it was better not, so that I might avoid travelling over ground excellently covered by Dr. Leslie Mackenzie and others, and might pick up the threads of the discussion as I found them.

I make no claim to expert knowledge. My only qualification is that I happen to be, as a member of the Sheffield Council, Chairman of the Committee charged with sanatorium work; as a member of the Education Committee I happen to be chairman of the department concerned with medical inspection and treatment and with special schools; and may I add (what I hope is no disqualification for this discussion to-day), that I look at all these matters through the miserly spectacles of the chairman of the Finance Committee. I hope, therefore, I shall not estrange my friends from north of the Tweed, who are credited with some anxiety for the bawbees.

The subject announced and discussed yesterday afternoon and continued this morning is: "The Powers and Duties of Sanitary Authorities, and the Working of the National Insurance Act in Connection with Tuberculosis." I invite you first to a consideration of what is the duty of a sanitary authority. I think there is nothing more dangerous than an attempt to give a comprehensive definition of a large subject; but, letting my courage exceed my wisdom, I shall attempt in a sentence such a definition, and I shall be glad if it is discussed hereafter. I suggest to you that we may fairly say that the duty of a sanitary authority is the establishment and maintenance of conditions most conducive to the maximum amount of health in the community at large. That involves necessarily the exercise of all the statutory powers vested in the authority. The limitations which are involved are to see that we do not act *ultra vires,* and there is always the limitation in all religious, social and philanthropic reform—that of finance: because, believe me, it is not merely a matter of parsimony; but we enthusiasts must remember that if we place too great financial burdens upon the community at large, we, to that extent, diminish the fund out of which the poorest members of the community have to bear the first of all charges, namely, the cost of their own living. As to finance in connection with this subject I shall have something to say later.

I do not share at all the fear that this work need make any excessive or inordinate demand upon public resources. The statement of what this work costs is the presentation of one side of the balance-sheet. We show the liabilities; it is more difficult to show the assets. There are some big savings. In the first place we may naturally hope for a reduction in the cost of poor-law administration, and we may naturally look for some reduction in the cost of public and private charity. I want to say when you consider the other side of the balance-sheet, remember that it has been found impossible in all ages to state in terms of money the value of human life and happiness. We may claim that the prevention of unfitness is a sound investment, and that you may not judge this matter in any sense fairly if you look simply at the cost. We must remember in dealing with this subject that it would be very difficult for a chairman to rule out as irrelevant any topic which affects social reform. Something was said yesterday as to the necessity for drastic amendment of the Poor Law. With that, in other places and at other times, most of us here would be in assent. Something was wisely said, by Dr. Leslie Mackenzie amongst others, about housing reform. We have also in mind in connection with this matter the necessity for the closest supervision of health conditions in factories. In my own city's trade, conditions are such that instances of pulmonary consumption attack are doubled amongst males, while among those not engaged in industries it is about normal. We cannot ignore as reformers in this work the necessity for personal habits to be revised and improved, and temperance reformers might find in our work a field of discussion in support of their propaganda. But I want to say that we shall fritter our time away and dissipate our opportunity if we let our discussion travel afield in these attractive meadows and do not confine our attention much more closely to the specific subject, viz. the relationship of public health authorities to the prevention of tuberculosis having regard to new duties under the National Insurance Act.

In the Report to which reference was made yesterday, the Interim Report of the Departmental Committee on Tuberculosis, local authorities will find a fund of most useful information, and I am going to assume, if I may, that the members of this Conference are familiar with the contents of that most interesting document. That document speaks of the existing powers which sanitary authorities have quite apart from national health insurance, and it speaks in a very apt phrase of the reinforcement of those powers by national insurance. Dealing first with the duty of public health authorities, I should like to say that it is quite impossible for them to give preferential treatment to insured persons; a public health scheme must operate equally and justly for all citizens alike. I want also to emphasise the powers—(I have no time to deal with them exhaustively without wearying you)—indicated in that Report, which I think are ample to enable public health authorities to discharge those duties equally and impartially to all citizens. The Report assumes, and I also take leave to assume in this Conference, familiarity with the size of the evil and with what is generally possible in its treatment. May I say it is not advisable to make that assumption before the authorities you represent at large. Put first in your campaign the humanity of this scheme. Do not assume that every member of your authority is equally enthusiastic with yourself. It is wise to start with a statement of simple elementary facts. Do not be discouraged, nor let your authority be discouraged, by statistics of the failure of work in the past. Remember, as the most hopeful of all signs as proving the curability of the disease, that post-mortem examinations demonstrate that many persons who have never known that they were subject to the disease have been automatically cured.

The Report indicates a national scheme, and to-day, Sir, I am anxious to pose entirely as an advocate of a national scheme. There is injustice if one authority be doing its duty and an adjoining authority be neglecting it. The weeds that grow in my neighbour's garden infect mine. Such strength and energy as I have got will be given to an appeal to make this scheme national, and it can only be that in so far as it becomes the work of the local authorities. The second point emphasised in the report is the work of prevention; the third, detection; the fourth, treatment; the fifth, research. Of the fifth I propose to say little or nothing, because that is work which will not be primarily the work of local authorities; it will be undertaken by the central authority, the Local Government Board, primarily charged with the control of the public health.

As to prevention, we are better equipped than ever we were, but of this I shall say more in a few minutes. As to detection, we certainly stand a long way ahead of the position of a few years ago. My own city took voluntary notification under its care in 1899; in 1903 we got private legislation to secure compulsory notification; and since 1909 that has been the general law of the land. But I regard the members of the school medical staff as being of the first importance in this matter of the detection of the disease. All of us here, I am sure, have a good many sides to our public life, and those of us who have anything to do with school medical inspection and treatment are beginning to realise the ghastly fact that there are definite and clear cases of pulmonary consumption—to say nothing of the earlier forms of the disease (glandular tuberculosis, etc.)—amongst young children. The admission of the school medical officer to the home and of the trained nurse (to which I attach very great importance) gives the opportunity to know the weakling who is in danger of becoming a consumptive; and if preventive work is to be successful, that preventive work must not leave out of its calculation the careful examination of contacts with definitely ascertained tuberculosis cases.

The examinations which will become so universal for purposes of friendly societies and for approved societies will give further opportunities for examination of the adult industrial classes; and if the doctors who are entrusted by friendly societies with these examinations can only be got—and I think they can—to help in this work of diagnosis, they may select suspected and doubtful cases to be diagnosed more accurately where there are better facilities, with the greatest possible benefit to the public health of the country.

What is the position under the Act? I speak with hesitation upon a matter which is raising a good deal of criticism—amongst other criticism one yesterday afternoon in this Conference by a gentleman from the country across the Channel, which produces the best Englishmen—a gentleman who added to the gaiety of our proceedings in an excellent speech. But he spoke of the National Insurance Act not with whole-hearted approval, and thought that the gentlemen who had signed the interim report had endeavoured to be as opaque as the Act itself. I do not dread a quarrel with an Irishman; no Irishman ever loves you unless you quarrel with him. And his affection for you increases according to the lack of justification for the quarrel. I venture to suggest that a good deal of the obscurity in the reading of the Insurance Act and this Report is not due to any fault in the type but to political myopia. Having said that, I have a criticism of the report to offer, and I offer it in the presence of some distinguished signatories of the document. They assume that an insured person has no right as right to sanatorium benefit. I respectfully submit that that assumption is too easily made and too readily arrived at. One section of the Act, Section VIII, dealing with benefits, distinctly names amongst the benefits of insured persons sanatorium benefits. It is equally true that in a later part of the Act the right is made subject to the decision of the Insurance Committee; but, as a prospective member of an Insurance Committee, I have asked myself this question: If an insured person asked me for sanatorium benefit upon what grounds could I refuse that benefit properly? And I take it that the only ground would be a selective ground personal to the individual himself, and not because there was no money for the purpose. Otherwise you would get another injustice—preferential treatment among insured persons themselves, which is impossible to conceive. Therefore, I may start from the position that the insured persons have, if not a right that may be legally enforced, at least a right every Insurance Committee must recognise, and which public authorities must concede, to sanatorium benefit. In meal or in malt every insured person will, then, have the right for himself or herself to have the benefit of consumption treatment.

The duty of the Insurance Committee is indicated in the Act. It is an imperative duty. The word used is not "may"—"the Insurance Committees shall make arrangements with persons or authorities." The duty is, therefore, upon the Insurance Committees to make arrangements; and I hope they will exercise it to the full by making arrangements as to every existing organisation for treatment which can pass the tests of the central authority. I hope, although here as a whole-hearted supporter of the present scheme, that the result of the passing of the Act will be to give more power to the elbows of everybody engaged in this work in the past rather than to diminish or decrease that power. But, when this has been done, when all the existing institutions are utilised to their fullest capacities, the problem will only have been touched by the little finger—the real problem. What are the authorities to do in order to take their share and be enabled to make a bargain with the Insurance Committees? Again may I offer a word of friendly criticism of the Report. The Report assumes that it is only in the case of excess of cost occasioned by treating dependents that the local and national resources may be called upon in subvention of the insurance fund. My friends who want to follow this more closely may refer to Section 17 of the Act, and they will find there that it is the fund for dealing with both the insured and their dependents which may be deficient, and may therefore ask the local authority for help with a Treasury grant to a similar extent.

May I say upon this question that it has been assumed in the Report, and in the discussion heretofore, that the only fund available primarily for the purposes of this department of work is 1*s.* 3*d.* per head (I ignore the penny per person per year) of the insured persons. One learned writer, Mr. Orme Clarke, suggests as a likely reading of the Act that the Insurance Committees may ask for a Treasury subvention of two ninths of the cost, which is the proportion in which the Treasury helps the other branches of the National Health Insurance Act. I go further than that. Your Association is now in the proud position that you have got the Government of this country at your back, and the value of a

Government pledge to deal with this matter is not the immediate sum voted, but the obligation to see the thing through.

If you look as to how and where the local authorities are going to assist, turn to Section 64 of the Statute. The unit indicated as a convenient one is the County Council. Under Section 64 there is contained an important provision which has not yet received discussion here, and which raises the very interesting question as to whether, after all, it is open to County Councils to do or to leave as they please; because Section 64 provides that the Local Government Board may make an order (please note the phraseology) for the grouping to secure co-ordination of the county authority and county borough and other authorities under joint boards for purposes of providing sanatoria. Suppose a County Council declines to take the initiative, suppose the Local Government Board makes its order forming a joint committee, who will be bold enough to say that order is one which may be disregarded, and that there is not under this Section the power of compulsion?

It has also been assumed that there is no power to compel patients to enter sanatoria. That assumption is too lightly made. Many friendly societies so regulate their rules that a person who declines proper treatment is denied benefit; and as I read this Act it is certainly open to the Commissioners and Committees to so regulate their management, that persons who wilfully and without just cause decline to take steps to promote their own health may be deprived of other benefits; and there may be some power of compulsion in that.

Might I now explain why I, in a weak moment, consented to take this position and address you? In Sheffield we have had our toll of death from the disease. Sheffield, as no doubt you will know, is the largest city of the largest county in the British Isles. Under the guidance of our medical staff (and in this I wish to associate with the medical officer of health, Dr. Ralph Williams, who is the school medical inspector, and Dr. Egerton Williams, who is the medical superintendent of our city hospital, and others), we think we have anticipated the whole of the recommendations of the Committee. I do not want to give the Committee away, and say the recommendations came from Sheffield; but what I do want to say is that they could not have gone to a better place for information. May I indicate, then, some practical ways—I am anxious to be exceedingly practical upon this matter—in which we have been working in our city by way of laying a foundation; for what we have been doing at Sheffield may be a help to some of you as to what are the possibilities with your own local authority. I am not unmindful as to the difference between county administration and borough administration. I would like to remind you of one matter here—that travelling expenses may be defrayed by insurance committees, a useful thing in the counties; and, in passing, I should like also to say that the fact that sickness benefit is to be paid during residence in an institution removes a great difficulty which most of us had in the past in advising an industrial consumptive to enter an institution.

Having got our powers of notification in Sheffield, we have for some time past used our University and its bacteriological department for the examination of specimens. We have had two male inspectors whose duty it has been to follow up immediately the notifications received. We have seventeen women inspectors doing ordinary health duties, but who are specially educated and trained in this matter of visiting the home of the consumptive and disseminating true education, the first element in prevention being, we think, the true education of the individual consumptive. In addition to distributing this information these inspectors also visit cases coming out of sanatoria. We have got two boards of guardians who are fully alive to their possibilities in this matter, and they have established 150 beds for dealing with acute cases coming under their care.

Again, may I allude to what I consider a most important part of this work—the isolation of acutely infectious cases.

Some years ago we utilised our smallpox hospital (and may I say, in passing, it is terrible to see large hospitals like these in so many places doing nothing), and we have found that without the least difficulty we can put up twenty beds in one ward for consumptives, where they have undergone a course of training, for short periods as a rule—a course of education which has not stopped short of realism; for we have shown the consumptive patient the bacillus extracted from his own sputum under the microscope so that he might realise in an unforgettable way that his enemy was a real and fearful one.

The results in this place have been extraordinary. I know one case in which 32 lb. were gained in six weeks in a Sheffield city hospital. It told its tale of starvation before, and there is a danger that when you have by good feeding, healthy conditions, and rest produced perhaps even abnormal health for the moment —you may too suddenly send back the consumptive to less food, worse conditions and harder work. We followed this by taking an old house which had come into the Corporation's possession in connection with street improvements, and adapted it (it is in a populous centre) for twenty other consumptive patients.

We have now in mind, immediately, a disused hospital pretty well in the centre of the city, which can probably be used for the purposes not only of insured persons, but also to provide for observation beds, which the Committee recommend; and some hospital beds for acute cases not finding their way to the Poor Law authority. Let me here remind local anthorities that there will be less cases for Poor Law authorities, and that we may make bargains with Poor Law authorities by taking over some portion of the well-equipped hospitals for immediate purposes.

We have established our tuberculosis dispensary under an expert, Dr. Chapman, who has inaugurated fully equipped out-patient departments, assisted by the medical superintendent and his staff and working with school medical officers. This has been done temporarily in some workmen's dwellings erected by the Corporation. Dr. Chapman has done some domiciliary visitation, and although I agree with the criticism of home treatment, you cannot get some people away from home, and we must make the best of it while they are at home. He is working in close connection with the voluntary hospitals of the city, going to assist the staffs of these hospitals in the tuberculin treatment itself. He is going among the factories of Sheffield where the disease is abroad, and teaching the men himself. After one such visit, he tells me, thirty out of thirty-two men who had listened to him voluntarily submitted themselves for examination to see if they had become infected by this disease.

I happen to be chairman for the time being of a conference being held with the Derbyshire County Council, to which we have called our own county council and county boroughs in the district, with a view to commence a scheme for the approval of the Local Government Board for establishing a sanatorium on the hills in Derbyshire.

I agree with going slowly in the matter of permanent provision. I should not at first take the 1 in 5000 standard suggested in the report. I should utilise in each place, as we have done in Sheffield, such accommodation as exists locally, and then I would establish the sanatoria, making the necessary final arrangements for schemes with adjoining authorities who are not establishing their own sanatorium. I should put up an administration building, giving somewhat larger size than immediate necessities demanded, but would have an accommodation for patients provided with a view to easy extension. On the question of cost we shall defeat our own object if we have costly buildings. We want the minimum of building and the maximum of air. We shall therefore be bad health reformers, as well as false economists, if we allow extravagance.

We have made some estimates in Sheffield, and we know that if we get our joint board we shall be able to make bargains with the Insurance Committee for the letting of beds. Provisional Insurance Committees will be established within a month. We shall approach each in our district to know if they will utilise our sanatorium when we have erected it, and what demand they are likely to make upon it. Difficulties may arise if you attempt amalgamation from a little jealousy between different districts. One district may think another will make too large a claim on the provision. Agricultural areas will say, "We do not need it as much as the great city, and the great city will drag us into helping to pay for their requirements." That you can get rid of by dealing with your capital and maintenance charges on the basis of user.

As to the capital, three fifths up to £150 per bed will come as an initial subsidy from the Treasury out of the million and a half set aside by the Finance Act for that purpose. The balance need not be large enough to alarm any ratepayer. So far as the sanatorium deals with insured persons, a charge should be made upon the insurance committees to cover both capital charges and maintenance. In Sheffield we hope this sum will not substantially exceed 28*s.* per week. Yesterday we were privileged to see the beneficent work carried on amongst the crippled children (mostly tuberculous) at Swinton House. I trust that this work will be paid for out of local and Imperial funds, and not form a charge on the Insurance fund. The education authority have ample power to deal with it, and there is a sum of £60,000 which the present President of the Board of Education has persuaded the Chancellor of the Exchequer to give him to distribute amongst the authorities in aid of medical treatment as distinguished from medical inspection.

We must be particularly careful to avoid overlapping. We have too many authorities doing the same work; the Poor-law reformer is quite certain of that. We want to avoid overlapping; how can we do it? You can do it by making the tuberculosis dispensary the central unit. You will do it by the fact that you will have some of the same persons on all your bodies. You can do it by letting your local health committee supervise, and their medical officer of health advise the Insurance Committees. I suggest that probably a sub-committee of the health committee, with co-opted members from every other authority affected, should deal with the tuberculosis dispensary itself. I want to say also that I am not at all sure that it will not pay the authorities to deal with this matter, not only pay in health and happiness, but pay in money, which is nearer to the hearts of a good many people. I would like to remind those whom the financial aspect worries that there is a Section 63 in the Act. If they find that excessive sickness is caused through the neglect of the local authority, that local authority may have to pay for the excessive sickness.

May I, in conclusion, express the hope that this Conference will not end in mere talk. If it is consistent with the province of the Conference, I should be delighted if with the weight of this distinguished gathering we could make a direct representation to every local authority in the country to do its duty, and join in waging war as a nation against what is a national peril.

THE AFTER-CARE OF PATIENTS WHO HAVE BEEN TREATED IN A SANATORIUM.

By Dr. H. W. McCONNEL.

In the last two years great advance has been made in the matter of after-care throughout the country. Two years ago more than half of the sanatoria in England considered after-care unnecessary, or at all events they did nothing in the matter, but now the very large majority approve of the principle at least, and more than three quarters have actual after-care of one sort or another in operation, and surely this is right, for it is useless, and a waste of public money, to go to the great expense of sanatoria treatment to restore a patient to good health again and to teach him how to keep well, and then to do nothing more than stand aside and allow him through want of knowledge or stupidity to slip back once more among the unemployed or unemployable, a burden to himself and to his friends, and to the local rates.

The patient's future should be considered from the time he enters the sanatorium; his after-care should be anticipated and should be borne in mind all through his stay there, and will have to be continued after he leaves till he becomes independent of such help.

At an ideal sanatorium the patient is taught that arrest of the disease and a return to wage-earning capacity is the object of his stay and he is shown that work is an essential part of the treatment, he is filled with hope as to his future, and he is not allowed in any way at all to develop the habits and manners of the loafer. As soon as he is capable he is put to little jobs in and about the place, at first very light, but gradually increasing in severity with his increasing capacity, and so he is gradually brought, before he leaves, to do a full day's work and is turned out hard and capable.

After the patient has been at the sanatorium for a time and the resident medical officer has been able to correctly sort his case and his capacity his employment and its surroundings are then inquired into, and in view of his past and its possibilities, and with due consideration to his present condition, suggestions and recommendations are made as to his future, and if he is a good case and capable of work, efforts are made to arrange for a definite job for him to take up when he leaves the sanatorium, and finally, just before his departure, further advice is given him as to his future—so he leaves in as good health as his case allows, primed with information and teaching what to do and how to do it and full of hope for the future; and thus, passing out from the sanatorium and from those interested in him there, he comes under the influence of the After-care Committee proper.

The happy result at the sanatorium is aided in two ways:

First by the working patient's scheme, under which some of the patients are kept on at the sanatorium for a further period as part of the temporary staff of the institution doing definite duties, but still under strict treatment. This gives them a further time to get well and hard, and a further opportunity to find a suitable job to go to when they leave. And—

Secondly, by lectures and advice. In this way the patient is taught something about the rationale of his treatment, and how to keep well afterwards, and what to avoid and what to do. It is a great point to get clearly into his head why fresh air is good for him, why he should rest before and after meals, and why he should eat slowly, and avoid excess of any kind. Lectures and talks at the sanatorium can do much to help him afterwards; and, moreover, if this teaching can be carried also into the homes, much further good can be done; so, with this object in view, he is given a leaflet or card of instructions to take with him when he leaves.

Sanatoria at present may be divided into two classes:

(1) Subscription supported; and

(2) Rate-supported.

In general terms, the features of the subscription-supported sanatoria are enthusiasm and a great deal of voluntary work; in fact, in most cases it is the energy of a few enthusiasts which starts the sanatorium and carries it along.

Money is rather short, and is made to go as far as possible both in building and in administration. It is these sanatoria that we have to thank for finding out how best to build and equip an institution on the least possible cost, and to make a hundred or a hundred and fifty pounds go as far as a thousand elsewhere.

As regards after-care, this is done mostly by a local committee around and in the neighbourhood of the sanatorium; first because the enthusiasts who run it live near, and secondly, because, as the patients' homes are usually at a distance, and they are difficult to follow, it is easier though not so effectual to after-care them before they leave the sanatorium. This being so, it follows that a great deal of stress is laid upon the sanatorium part of the after-care—that is, on the working patients' scheme and the lectures and the educational talks, and the patients have often to be left to self-care after they leave rather than to the labours of a properly organised after-care committee.

Patients, of course, are asked to report, and some efforts are made to keep in touch with them later.

In the rate-supported sanatoria, on the other hand, matters move more slowly, and there is often long consideration before action is taken, but when it is, money is granted, and is certain both for the building and for the maintenance. But in the ease with which it is got lies a danger of waste, and I have known more than one instance in which building and internal fittings were arranged for on the grounds that "we have the money" in a way in which they would not have been if there was a difficulty in procuring it.

The medical officer of health is usually in charge in these sanatoria. He is already a busy man, and local authorities have not grasped how much work a sanatorium demands, or have not appreciated that no man can do more than a certain amount properly; the result is that, unless the medical officer of health happens to be extraordinarily keen, or blessed with superhuman energy, there is a danger that some of the work is skipped, and amongst other things, after-care is easily passed over. Moreover the point of view of the medical officer of health is often different from that of others interested in the case; he wants to prevent rather than to cure, and he is more interested in taking advanced cases and in preventing them infecting others than in starting off an individual good case in wage-earning again.

In these rate-supported sanatoria most of the patients are local, so that a local after-care committee often gets better results than can be expected in subscription-supported sanatoria with patients from a distance. There is, however, usually little money available for this after-care—this is, again, owing to the want of appreciation by the local authority in the matter, and so the work is often handicapped and half-heartedly done.

As examples of subscription-supported sanatoria I will take Kelling, Blencathra and Daneswood—they each have peculiarities in their after-care—and then I shall mention a few instances of rate-supported institutions.

Kelling is in Norfolk and has seventy beds. It has been open for ten years, and has done much pioneer work, both in sanatorium building and in the working-patient and after-care schemes.

The working-patient scheme is in full operation, and is found specially applicable to the single men or women who have no home ties. At Kelling the organised work in the sanatorium is under a special officer called the overseer, subject of course to the control of the residential medical officer. All sanatoria are recommended to have such an officer, as he saves the residential medical officer a lot of non-medical work, and ensures that the work is really properly done, and that there is no loafing.

As regards after-cure, Kelling has been fortunate enough from its commencement to secure the honorary services of a retired medical man to push this side of the treatment. He acts in conjunction of course with the residential medical officer, and does not interfere in any way with the medical treatment proper, but from his special medical knowledge he is able to advise the patients as to their future in a way which it would be impossible for a layman to do.

He usually visits the sanatorium weekly, and in doubtful cases or in cases requiring an outlay of money he can always get the advice and sanction of the House Committee.

Notes of the recommendations given are sent to those interested in the cases after they leave, but it is impossible, as few of the patients live near Kelling (some come even from the Isle of Man), to do more than this. The patients, however, are always welcomed if they can call again, and cards are sent round at Christmas time to all that have been at the sanatorium to ask how they are.

The after-care at Maltings Farm and at Maitland Sanatoria is done much in the same way as at Kelling.

At Blencathra more help is got from the Charity Organisation Society. Blencathra is in Cumberland, and its patients mostly are Cumbrians; the after-care work proper is chiefly seen to by the Carlisle Charity Organisation Society, and usually with great benefit. Many cases struggling on with unsuitable work have been helped to healthier surroundings, and patients showing signs of relapse are noted by the visitors. The organisation is that of the Charity Organisation Society with well-kept sheets, a secretary and honorary assistants. The ex-patients are visited at their homes, advised as to diet and hygienic conditions, sometimes money is given for food and clothing, or to help them to a better house. Ex-patients are urged to come to the sanatorium at regular intervals for examination and advice.

At Bellefield the after-care, with its graduated labour at the sanatorium and its most excellently organised Ladies' Auxiliary Committee, is carried on in the same way and on the same lines as at Blencathra, and with most excellent results.

At Daneswood the conditions approach to the ideal, and what might be obtained under a rate-supported sanatorium, for there is a sufficiency of money and great enthusiasm.

Daneswood is in Bedfordshire, and only takes patients of the Jewish persuasion; it is supported by private subscriptions, and by the Jewish Board of Guardians. Most of the patients come from London and return to London, and both before and after their visit to the sanatorium are under the control of the health committees who refer the cases to the after-care committee if a money grant is recommended. About £400 a year is spent by this after-care committee, who find new work for their cases or emigrate them; they often start them in small shops or hawking, making use of the Jewish love of barter, and, as they find the money, are in a position to demand obedience in the home and its surroundings.

At the sanatorium the housework and the digging, etc., are done by patients, and after they leave there is always some kind friend to take them in hand. If the conditions that obtain at this Jewish Sanatorium were found elsewhere, the question of after-care would be easily solved.

I may specially note that the after-care committee at Daneswood carry on their work near the patient's home and away from the sanatorium, and this is rendered possible because most of the patients come from the same neighbourhood. The after-care committee is kept in touch with the findings of the resident medical officer at the sanatoria by a monthly visit there of their secretary, when every case that is to leave before the next visit is brought up and considered.

Now to take a few instances of after-care at rate-supported sanatoria.

First, *Salterly Grange* (Cheltenham). This institution is under the control of the Birmingham Health Department. Advice is given at the sanatorium, and the patients are put on to work as soon as they are fit, either with the gardener, carpenter or engineer. The after-care work proper is carried on by the medical officer of health and his health visitors. Tuberculin inoculations in full doses are continued and the patient regularly visited, and if relapse occurs the cases are sent back to the sanatorium. The medical officer of health (Dr. Robertson) wrote me last month (May) as follows:

"We have employed tuberculosis visitors for a considerable time and this week we are doubling the number; all but one of these are trained nurses who have had experience in dealing with sanatoria or dispensary cases, and their duty is to keep the patients under observation and to report to me anything that they suggest if a sanatorium patient is not living under conditions that appear to be quite good. All the patients are seen once a quarter by one of our doctors after they leave the sanatorium during the first year or eighteen months, and after that at longer intervals."

All this appears to be most excellent, but it is more directed to bettering the patients' health than to keeping them employed.

At *Macclesfield* there is a recently started borough sanatorium of ten beds under the medical officer of health, which, though most excellently carried out, is meant only for advanced cases, so the institution may be looked on as purely educational and preventive. There is no after-care committee, but the health visitors follow up the cases and the relief associations also give food when wanted. A satisfactory leaflet is given to each patient on leaving.

At the *Aitken* Sanatorium in this county (Lancashire, fifty beds), the matter of after-care is still under consideration, waiting, I think, like a large number of institutions, till the Insurance Act comes into force, but every case on discharge is notified to the medical officer of health and is then referred to the health visitors. The services of the local Charity Organisation Society are often called in.

At *Bowden* matters have advanced a little further; selected cases do light work, gardening, poultry farming, etc., and after they leave the sanatorium are visited by lady visitors, who report to a committee if assistance is needed.

At *Maiden Law* advice and education to the patient at the sanatoria and self-care after he leaves is much trusted to, but there is also a ladies' visiting committee.

And so on at several other places, the details of which I have not time to give.

There is one point, however, of interest discussed by various authorities, and that is whether the health visitors should be paid or not paid. I think it will be found best to have a paid secretary and a special phthisis nurse, but there will always be room for the unpaid health visitor and Charity Organisation Society worker, who will become more and more skilled as they gain experience and will always infect the whole scheme by their enthusiasm and individuality.

And now I come to the consideration of after-care under the Act.

This is somewhat difficult, as there is not one word in the Act referring to after-care. This is a mistake, for the failure of many cases to keep well and their falling back into ill-health is due to the absence of after-care, and it would have been well to have marked its importance by at all events introducing the name into the Act.

But the advisory committee, chairmaned by Mr. Astor, have valiantly pressed forward its claims, and if the Insurance Commissioners and the Local Government Board can be duly impressed with the importance of the recommendations on this point, sanatoria will at once begin to show results which they have not hitherto achieved.

It is an opportunity of the greatest moment and one which should not be missed.

Now to turn to the recommendations of the Advisory Committee.

I think that *they* would have been better advised to have used the term "after-care" in a wider sense than they have. They use the expressions "sanatorium benefit" and "sanatorium treatment" in a wide sense, *i. e.* to treatment not only in the sanatorium, but even in the patient's own home, so here it would have been well to have included in the term "after-care" anything and everything that would tend ultimately to the after-caring of the patient; that is, the after-care of a patient should not start and be first considered after he leaves the sanatorium, but on the very first day of his arrival there; for, as we have seen, a great deal is done at and round the sanatorium itself in work and also in advice, and at the least he is there taught *self-care,* which is twin sister to *after-care.*

Again, in the interim report they state that *discretion* should be used in after-care, and publicity avoided because of the exaggerated fear of the infectivity of consumption among employers and fellow employees; this I think also is a mistake. The fear of infection is exaggerated, but a policy of *fear of talking* will not help to correct this. I think, on the contrary, that there should be much talk about it and employers shown that they are wrong, and that a man who has been to a sanatorium and who obeys the rules there taught is not dangerous or infectious.

With these two small exceptions, I am fully in accord with the rest of the Advisory Committee's suggestions on after-care.

Their main scheme of passing the patients on their way to a sanatorium first through a dispensary under a capable tuberculosis officer and of then referring them back again to the dispensary on their discharge is a very excellent one, and should meet with warm approval, for it insures that every case is properly considered, and it allows of the happy co operation of voluntary care committees and of paid health visitors under the chief tuberculosis dispensary officer. It brings all these agencies into line and prevents overlapping of effort. I may mention here perhaps that the experience of existing institutions shows that a grant of money for after-care is most desirable to prevent relapse through want of food or to help for a time an ex-patient to better quarters and sometimes to start him off in a new career. It should be made possible for insurance committees to give such money when desirable and when recommended by the after-care committee.

So under the Act the machinery for after-care should be as follows:

(1) At the dispensary the chief tuberculosis dispensary officer, who first sees the case and sends him for admission to the sanatorium.

(2) At the sanatorium—

(*a*) The resident medical officer, who treats the case and gives lectures and teaching, and also arranges for the working patients' scheme.

(*b*) A small honorary after-care committee, containing if possible a retired medical man, with a paid secretary.

This committee, called "The Sanatorium After-care Committee," would meet at intervals, and with the full concurrence and assistance of the resident medical officer would interview each patient and advise as to his future work and mode of life. These recommendations would be written down and sent, when the patient left the sanatorium, to the chief tuberculosis dispensary officer.

(3) At the dispensary the after-care committee proper, which might be called "The Dispensary After-care Committee," and which would be perhaps a sub-committee of the insurance committee with power to add to their numbers. This committee, which should be small, would act in full conjunction with the chief tuberculosis dispensary officer, whose advice and direction they would follow, and with the assistance or instrumentality of the special phthisis nurse, health visitors and local charity organisation society, etc., would keep in touch with the patient, visit at his home, see that he carried out the rules and recommendations learnt at the sanatorium, and generally would do what they could to help him. Latitude should be given in the formation of this committee so as to include those who are specially interested or skilled in this work in each neighbourhood, but it should be a *sine quâ non* that it should act in conjunction with, and under the direction of, the chief tuberculosis dispensary officer, who would be the centre of all this movement.

If the sanatorium was situated near the patients' homes, it might be desirable for the sanatorium after-care committee and the dispensary after-care committee to be one and the same.

In conclusion I should like to repeat that under this Act, if properly administered, the outlook for the after-care side of treatment has never been so bright, and if a small grant of money is allowed for the purpose and if the voluntary and paid agencies are linked up around the tuberculosis dispensary officer and the dispensary, a great deal of good should be done, and most of the present difficulties in the matter of after-care should be overcome.

But it must be remembered that each case must be treated and attended to on its own merits, and the individuality of each case must be fully considered; so it is desirable *on the one hand* to keep the committees small and to allow as full a play as possible to the enthusiasm of the few who are really interested and who really know, *i. e.* too much red tape and too much systematising must be avoided, and *on the other hand* each patient must be made to feel that individual effort is necessary on his part, and he must not be allowed for one moment to think that if he does nothing everything will be done for him; for the object of after-care is not to keep a large body of loafers alive, but rather to help those who help themselves, and to meet, if possible, in some way the handicap of their disease.

DISCUSSION.

Dr. Chalmers (Medical Officer of Health for Glasgow) said he thought the words that had fallen from the previous speaker were a sufficient illustration of the need for clear thinking on this matter of tuberculosis.

In the first place, however, he thought the meeting must feel extremely indebted to Dr. Leslie Mackenzie as a member of the Departmental Committee for his exceedingly lucid statement of their view of the Interim Report; and although one might well hesitate to refer to that report in the presence of some of its signatories, still, one could take heart of grace from the fact that all present were interested in the matter, and interested moreover in the practical sense of having to put the scheme into operation. The first point of importance they had to consider was that the report relegated consumption to a somewhat secondary position and dealt with tuberculosis as a whole. This was not only an important point—it was a vital one, and its meaning must be fully grasped. Personally he never had much sympathy with restricting the crusade to consumption for the reason that such a course proposed to deal with results only, that is with causes after they had become developed, and not before they had had an opportunity of operating. They were, therefore, now on a new basis. They were attempting to deal with tuberculosis throughout the whole of life, and were, he thought, in consequence more likely to be in a position to prevent consumption in adult ages.

Another important question emerged from the terms of the report itself; because it would be possible, he thought, within these terms to have two independent committees operating within the same geographical area, but covering different forms of the disease and dealing with different portions of life. He referred to the terms of the Insurance Act defining sanatorium benefit as available to insured persons. There was placed, however, in the hands of

Insurance Committees the power to extend sanatorium benefit to the dependents of insured persons. It was evident, therefore, that local authorities would be compelled to consider the question of their own action in this light. What did this extension of sanatorium benefit mean? What cases would form the majority of those with which the Insurance Committee dealt, and to which the sanatorium benefit was to be applied? If the Insurance Committee took a wide view, as he thought they should do, of the question, and extended benefit to dependents, what would happen? In the first case, the majority of persons receiving sanatorium benefit would be adults suffering from consumption; in the second they would be children suffering from other forms of tubercular disease, with which they were familiar.

But if there were an area where, despite local interest in the matter, Insurance Committees did not extend the benefit to dependents, and yet the local authorities were endeavouring to deal with tuberculosis, then the following among other anomalies might appear. That is, according to the terms of the Interim Report they might have a tuberculosis officer who was the officer of an Insurance area visiting where the father was consumptive, and the officer of the sanitary authority visiting the same house if one of the children had, say, tuberculous disease of the glands or bones.

Now, he asked, was it seriously contended that this should be so? The Report undoubtedly made it possible, but by acting in that fashion it was evident that there would be enormous waste, and the results would most likely discourage the continuance of effort. The value of Dr. Mackenzie's paper to-day was that he had clearly outlined a new development which would cover tuberculosis as a whole.

The terms of the Report were exceedingly elastic, and it would be difficult for any authority to plead that in their given circumstances the recommendations were inapplicable, but there was one point which should be insisted upon. The Report had rehabilitated the old idea of the consumption hospital. Experience of dispensaries had shown their inadequacy to decide finally the question as to whether children in given conditions were tuberculous or not; and even with regard to adults something more than dispensary facilities were wanted before the question could be answered whether the patient would or would not be likely to benefit by treatment withe graduated exercise.

The Committee had, therefore, he thought, rightly agreed that beds should be provided, but he differed from them in this respect, that for large centres of population, at least, these beds should not be in dispensaries but in hospitals.

A further point of some importance concerned the cost of the buildings which were to be erected for sanatorium or hospital purposes. It was stated in the Interim Report that sanatoria could be built and equipped at a cost of £150 per bed, including site. He would like to ask if this had the support of architects generally, because in some recent proposals which had come before him the cost per bed would be more nearly £300, and even then the cost of the site was not included. It was above all things desirable at the present time that they should have some fixed specification for the kind of hospital which could be built and equipped at the cost specified in the Report.

Reference had been made during the discussion to the unsuitability of treating cases of tuberculosis in houses of one or two rooms. He came from a city where almost two thirds of the population lived in houses of not more than two rooms. His question had reference to this point—If it were necessary to provide hospital or sanatorium beds for persons so situated, what was to become of after-care? If it were necessary to remove them to a sanatorium for treatment or education, how were they to benefit permanently, or even practise the lessons they had learned regarding open-air life. That was where the problem of the control of the disease lay, namely, in the indifferent housing and bad feeding of so large a proportion of the population.

Someone had suggested that they should so educate patients that they could lead a sanatorium life in their own homes. In Scotland the tenement system largely prevails, and it was not difficult to imagine the obstacles to anything approaching this in many houses of the type with which those who came from Scotland were familiar. Morever, before they could ask people to live an open-air life of that sort, ample food and suitable clothing was necessary. This meant that they must look into the economic conditions which controlled the family life, for only by that means would they be able to help.

Dr. **Francis E. Fremantle** (County Medical Officer for Hertfordshire) wished to deal with one or two points in relation to a different area from that which most in that hall would have in their minds—not the large boroughs, but a fairly average county with no town in it of over 40,000 inhabitants. With a provision of one bed for every 5000 population, only sixty beds would be required for a county of 300,000; it was obviously desirable, however, to have a sanatorium with a minimum of 100 beds for purposes of economy in building. An extra thirty or forty beds above the population standard suggested must be provided. There were two ways in which these could be utilised. Dr. Leslie Mackenzie had already pointed out that there was no strong line of division between cases that the Committee said required hospital treatment, and less advanced cases which required sanatorium treatment. Another way in which the difficulty could be arranged was that the authority might lease out the surplus beds to other authorities too small to provide their own.

As regards cost, Dr. Chalmers said that £300 a bed was the least sum. The thing had actually been done at a good deal less than that, less even than the Departmental Committee's figure. Benenden was built at £100 a bed; and at Bradford a block had been erected at £50 a bed apart from site and administrative section. Benenden showed that the work might be done at the cost suggested in the report, even if they took the cost of that sanatorium as the minimum cost for the work.

There was one other line of thought he wanted to suggest on the question of the dispensary unit. He was glad to see the dispensary unit was stated in the report as a primary thing. Take the area he had spoken of where there were thirty-three different districts; how could they provide a dispensary system if buildings were compulsory? If they had twenty-six towns, were they going to put a dispensary in one with a mere handful of inhabitants?

According to the report the essential thing was the tuberculosis officer, who would note cases of tuberculosis and report on them. It was probable that in each district in a county there would be only on an average some ten people to inspect. It would be infinitely better for him to visit them in their homes. He would not only see the patient, but the patient's surroundings, and he could treat not only the patient, but the surroundings, and help the patient to live a healthier life.

Again, the tuberculosis officer would see not only the surroundings but the family. He could keep in touch with the contacts, see the wife and children, and treat them at the earliest possible stage if they were attacked. He could also meet the district nurses and medical attendant, and could tell them before the family what were the essential things for them to do to carry out the treatment while waiting for admission to the sanatorium. Further, the officer could advise about after-care after the return from the sanatorium so that the good received there might be maintained. He hoped the meeting would emphasise visitation as essential in this matter.

Councillor J. H. TEBB (Tynemouth) was a member of a county borough council, which would have, of course, the privilege of initiating its own scheme; and the suggestion was that they should have a joint board with the county council. One of the first things would be to bring before the council figures showing the probable cost, because they must recognise that, while those present were deeply interested in this subject and would go to any reasonable expense, there were great numbers in public life who would not spend any money at all if they could help it. The first question in the borough he represented would be: What will be the cost? Another question would be: Is the council obliged to bring in a scheme at all? So far as he could see he could not recognise any compulsion in the matter, and they had to get people to see that it was a desirable thing whether there was compulsion or not.

Again, the Insurance Committee for an area was required to pay to a joint board a sum for treatment. In the case of his own area the amount that might be expended was 1*s*. 3*d*. per head. Were they to understand that the Insurance Committee would pay 1*s*. 3*d*.

per head for every insured person in the area? That was vital, and he would be glad if Dr. Mackenzie would answer it.

There was another question with regard to treatment for dependents on which the report was, he thought, certainly vague. If these people were to be treated it was only fair that they should be paid for. There was no indication in the Act whether this was to be so or not. If not, well, he took it that it was the duty of the municipality to do so on its own account quite apart from what the Insurance Committee might do.

Supposing the Act were adopted in an area, the local authority, after adopting it, might do as little as it possibly could—nothing in fact over and above what would be paid for by the Insurance Committee. That would, he thought, be a terrible thing. Sufficient power and interest were wanted among the people to see that the Health Committee wait on the work, irrespective of cost, for the public good.

Dr. LESLIE MACKENZIE (answering questions): As far as the Act is concerned the sanatorium fund is made up of 1*s.* 3*d.* per head per annum for all insured persons and 1*d.* per head preliminary grant. There is a proviso to the effect that the penny may be reserved for purposes of research; but the 1*s.* 3*d.* is to be spent in creating a sanatorium fund for the administration of sanatorium treatment. On the basis of the fund the local insurance committee is under an obligation to make an arrangement, and that arrangement must be such as to satisfy the Insurance Commissioners. That is how the Act stands. The adequacy of the arrangement, the expense of the arrangement, the length to which the total sum of the one-and-threepences will go, will all be factors in the minds of the Insurance Commissioners when determining whether an arrangement is satisfactory or not.

Dr. TRIMBLE (Belfast) was particularly interested in the afternoon's discussion as a doctor connected with a public authority. They had been asked to make preparations for July 15th, but until they knew how many insured persons there were in each area, and how many tuberculous persons there might be among them, it was absolutely impossible to proceed on anything like sensible lines. His advice would be to go cautiously.

He would suggest that the first line should be the local dispensary, which would be of the nature of a field hospital rather than a base hospital. To it would come all the tuberculous and supposed tuberculous patients. There would have to be an imitation of the Natural Association of Women in Ireland in its crusade against tuberculosis. They would have something to-morrow from the Countess of Aberdeen of the preventoriums instituted in Ireland to which the native girl or boy was sent to prevent them from becoming consumptives, and which would form part of this great campaign.

After-care, in his opinion, was an essential part of the system. A patient leaving a sanatorium would be under the same officer who saw him when he was a dispensary patient. He was glad there would be dispensary beds, because the patients would there be under observation.

Whatever they might have done as to the tuberculosis death-rate in England, they in Ireland had brought down the tuberculosis death-rate more than in any part of the kingdom, for it had fallen one half, and to-day there were 50,000 fewer tuberculous patients than there were four years ago.

Mr. W. H. Blyth Martin (Town Clerk of Dundee) thought it would be well that something should be said from the point of view of the local authority, and it was as the town clerk of a local authority that he would like to speak. That important Conference had two main sides—the medical and the humanitarian; but it had also, he thought, to deal with the financial side as it affected local authorities. The report of the Departmental Committee dealt with prevention, detection, and the cure or treatment of advanced cases of tuberculosis. He might say that the report struck him as the report of enthusiasts having a laudable desire to stamp out tuberculosis.

But it had been framed absolutely without consideration of cost, and if the Commissioners had had money in hand and been able to place it at the disposal of the local authorities, they could not have suggested one single further improvement than was in that report. Money was not a consideration of the committee, of course. It was not for them to look at it from that point of view.

But money was of interest to local authorities, and there was just a danger, in Scotland at any rate, where the local authority was in a different position, that if this movement proceeded with them all shutting their eyes to the cost and lacking a knowledge of the facts, that there might be some hesitation in bringing about an active carrying out of the scheme.

Take the case of Dundee with a population of 165,000. He had calculated that from the one-and-threepences and the pence the Insurance Committee would have about £3800 a year. The local authority was expected to provide sanatorium treatment on the basis of one to 5000 of the population, *i. e.* thirty-five beds, and these were to cost each 30*s.* a week; then there was interest and sinking fund. It would take nearly the whole of the £3800 to pay the cost of the treatment of the thirty-five patients in hospital alone, and there would be nothing left for the whole of the rest of the treatment of tuberculosis in Dundee. There were many deaths every year in Dundee from the disease, and he took it he should not be far out if he said there were 800 persons in the town suffering from tuberculosis. It would appear that thirty-five were to be treated under the sanatorium provisions, and of the rest of the cost of tuberculosis treatment half would have to be found by the local authority somehow. The Act said that if there was a deficiency the Insurance Committees were to make an estimate and present it to the local authorities, and if the local authorities approved they might contribute half of it. Now, he had asked this question of various people, and he asked it of that meeting: What was to happen if they did not approve? If the Insurance Committee presented an estimate for, say, £5000 to the local authority, and the local authority did not approve, what would happen?

He was entirely in sympathy with the scheme to deal with this disease; but he wished to point out the undesirability of their going on with their eyes shut, and of their ignoring the matter of cost. Let them face the problem and work together, and they would doubtless achieve results which would be beyond their expectations.

Dr. C. J. TEMPLEMAN (Medical Officer of Health for Dundee) believed that it was now possible to carry out a comprehensive scheme for dealing with tuberculosis without unduly taxing the financial resources of the local authorities. With regard to the question of cost there was one point they ought not to lose sight of. Was tuberculosis costing the nation nothing just now? If there was any reasonable prospect of dealing successfully with this problem, did they not think it a good matter of business to put a penny or twopence on the rates if the nation was going to get full value for the money? There was no field offering greater prospect of return (though it were not immediate return) which would be so fruitful of blessing to the country as the crusade against tuberculosis.

With regard to the provision of sanatoria, he was very glad the necessity had been emphasised for simplicity of construction. Some sanatoria he saw in America had the greatest possible simplicity, yet they were exceedingly efficient and useful and cheap. After all, when they came to think that they were dealing with working men in sanatoria, they wanted to make the conditions in the sanatoria approximate to the conditions which ought to exist in the workmen's house. That could only be done by doing away with all extravagant fittings. Many of these persons were apt to be impressed by their surroundings, and to think that the benefit of the treatment had not been due to good food, fresh air, rest, etc., but that there was something intrinsic in the building itself that produced the benefit.

With regard to dispensaries he had had some experience in Scotland. The city he represented had the honour of being the first to establish a municipal dispensary. Their experience had not been the same as that of Dr. Chalmers in Glasgow, who told them he found he did not get the early cases. In Dundee they had not had the same experience, because they had got quite a large number of persons who were not suffering from tuberculosis at all, but simply from a very low condition of health. A large proportion had been the early cases they were so particularly anxious to find. The speaker from Belfast told them yesterday that local authorities should be careful in establishing sanatoria just then, and should rather do nothing in that respect until they had found out the number of cases they would have to deal with. He did not think that any local authority would find that providing one bed for each 5000 of the population would in any place be excessive. He thought one for every 5000 was the minimum.

As to dispensaries, if this crusade was to be carried out successfully the work of the dispensary must not be divorced from the work of public health. This work, while it had special features of its own, must be carried out on precisely the same lines as work against other infection. If they appointed independent officers to do a certain class of work in connection with this matter, he thought the results would be correspondingly small. Although the Departmental Report seemed to indicate that the tuberculosis officer should be an officer entirely independent, he hoped that in working the scheme in practice it would not be so. He hoped rather that the whole work in connection with tuberculosis would be co-ordinated with other public health work.

Councillor CHALMERS (Convener of the Public Health Committee of Aberdeen): After the fine, comprehensive speech by Councillor Neal there was not much one could add to the discussion, but he felt they should not refrain in that Conference from paying a tribute to the medical fraternity for their magnificent work in connection with the campaign against the white scourge. Their work had been exceedingly fine, and the time and skill which had been devoted to the work demanded from the nation an expression of gratitude for what had been done. When that had been said in just recognition, they might hold that all they had heard there from the medical side had gone to show that the main problem, and the solution of that problem, was not a medical one. The speaker from Sheffield pointed out the great attraction there was to speak of other matters instead of dealing with the problem directly. The feeling that he had was that the problem could only be dealt with in an indirect way. Such things as he mentioned must be taken into account.

During the past twenty-five years a great deal had been done throughout the country to arrest tuberculosis. Twenty-five years ago there was not much being done comparatively to check the increase of this disease; ten years ago there was not so much being done by any means as to-day. And yet if they looked at the collected statistics covering that period they would find there had been a steady decline in death-rate. The causes had been in his opinion the increased advantages in social conditions and in public health conditions. These were the factors which had been working quietly, but as a result of their operation the death-rate was reduced in some cases almost 50 per cent. It could be shown from figures that as wages had gone up the death-rate from tuberculosis had decreased. It could be shown from figures that as there were fewer paupers the death-rate went down. The increasing attention being paid to such questions as sanitation and housing reform was having a very direct effect upon the most powerful side of this matter—that of prevention.

In Aberdeen at the present time they were singularly fortunate in regard to these matters. Of the four large towns of Scotland the drop in death-rate in Aberdeen had been rather larger than in any of their large neighbours. They had disposed of the dry-closet system, they had gone in for large clearances of slum areas, and they had dealt with the collection of the city refuse. These were factors which went to show that if this problem was to be adequately dealt with, the preventive side was the side to take up most strenuously. He did not contend that they ought not to deal with the wounded and the fallen.

The question had arisen frequently of the cost of sanatoria. He was glad to think that there seemed to be a consensus of opinion that these ought to be constructed as cheaply as possible. In Aberdeen they had been successful in this matter. They had twenty-one beds, the total cost of which was under £400, and their lifetime was thirty-one years. In that was not included the administrative block, but it did include everything else necessary.

Mr. T. C. Horsfall (Manchester): They were all taking for granted that they were in the dark as to what would be the results of sanatorium treatment. They forgot that Europe, at any rate, had had twenty years' experience of the use of sanatoria on a very large scale. Germany began to cover the land with them about twenty years ago. She acted with enormous enthusiasm, which seemed to be justified by the first results of sanatorium treatment.

No less than from 83 to 87 per cent. of the cases sent to the sanatoria were restored to the power of earning a livelihood. But what followed! The people were sent back from the sanatoria to their homes and workshops and began to relapse at once. And now the most careful authorities of Germany admitted that they did not know what percentage of these cases had been made permanently useful. But it was known that it was a very small proportion of the percentage of cases restored temporarily to the power of earning their livelihood. The conclusion that had been formed everywhere in Germany was that tuberculosis—especially tuberculosis of the lungs—was, *par excellence*, a disease of the dwelling and of the workshop, and that though sanatorium treatment was enormously valuable, the measure of its value was the degree in which it permanently reinforced life in the home and workshop. By treating tuberculosis as a disease of the home and workshop they had reduced the proportion of cases of phthisis amongst their grinders to about one fifth or one sixth of the rate that existed in Sheffield to-day amongst the grinders there.

An excellent suggestion had been made by Dr. Brown, Medical Officer of Health for Bacup, that the local authorities should carefully collect information as to the number of cases of tuberculosis existing in their districts, and where the home was obviously the cause of the disease let them take part of the money that they considered available for sanatorium treatment for the purpose of paying the difference between the rent of a larger or a better dwelling and the rent of the one actually inhabited by the tuberculous person. In many cases it would be found desirable to send tuberculous people to a sanatorium, and in that case, if the home was obviously unfitted to maintain health, part of the sum available for after-care should be used to pay the increased rent of a larger dwelling.

Councillor J. R. **Bibby** (Gloucester) wished to emphasise the undesirability of authorities doing anything at all in the way of expenditure on new buildings for sanatoria at present. His own county—Gloucester—had decided to leave sanatoria alone for the present. One reason was that the compulsory notification of cases had only been in existence for six months, and secondly, there was far more important work to be done by establishing dispensaries and appointing whole-time tuberculosis officers and tuberculosis nurses. Gloucestershire was to establish four dispensaries throughout the country, a whole-time tuberculosis officer to visit these dispensaries, and a tuberculosis nurse.

Dr. Cameron (Medical Officer of Health for Leeds): There were two kinds of consumption—the curable and the uncurable. Dr. Philip told them the other day that the greater proportion of children of fifteen, in fact nearly 50 per cent., had tuberculosis. Supposing they reduced it to 30 per cent., and said that one third of the children about the age of fifteen had tuberculosis. The number of deaths from tuberculosis was about one tenth of the population of the country. In Leeds it was about 8 per cent. from consumption, and from all forms of tuberculosis about 10 per cent. That had been going on for a number of years. It was evident, if these two facts were true, that there was a very large number of cases that had recovered. What he wanted to emphasise was, that up to the present time the cases that had been notified to them did not represent nearly the whole of the cases that ought to be treated. And he believed this was one of their great difficulties—the cases that ought to be treated were essentially the cases that were not notified to them. The cases that were notified to them as a general rule were the incurable cases. The curable cases unfortunately were not notified, and it was their duty to find them out in some way. That should be the aim.

He had one or two facts bearing on this matter. They had had a hospital in Leeds for some years in connection with phthisis. They had had voluntary notification for a great many years. Last year—1911—they had voluntary notification and also the Poor Law notification, and the number of notifications increased considerably. During 1910, 146 specimens of sputa were sent to the University by members of the profession throughout the city. Of these 146, which were examined under the suspicion that the patients were consumptive, only 33 per cent.—that is one fourth—were found to contain the tubercle bacillus. The remaining 67 per cent. were regarded as negligible. He could not tell how many of these were reported, but he fancied a great many were not. In the five months of 1912 which had elapsed a very large number of cases had been reported—760 cases. And in the same period 97 specimens of sputa were sent to the Medical School and examined. Of these, 23—equal to 24 per cent.—were pronounced positive, and the remaining 74 were pronounced not to be positive. More than three fourths were not positive. What became of these three fourths? Were they notified? The medical men sent them to the laboratory in order to ascertain whether they had tubercle or not and it was found that tubercle was not indisputable. He was sorry to say that only five—or 6·7 per cent.—of these 74 were notified to them as phthisis, although he had very little doubt that the whole were tuberculous. Their great hope was in dealing with the young. And if they had to make the mistake of treating too many cases let them make the mistake of treating all cases of the slightest suspicion.

Dr. C. KILLICK MILLARD (M.O.H., Leicester): Councillor Neal's cheery optimism was most refreshing and very unusual in the chairman of a finance committee. He wished all chairmen of finance committees had been there to hear his address that morning. But after all they had to face the question of finance and it was well they should look at actual figures. But nobody had attempted to give actual figures. They must face at the outset the fact that if they were to administer sanatorium benefit on the lines of the Departmental Committee's Report they could only do so at a loss, not very serious perhaps, but there would be a loss, and he sincerely hoped local authorities would face the fact boldly. Take the whole United Kingdom—the Departmental Committee recommended that 9000 sanatorium beds would be required and 9000 hospital beds, and 225 to 300 dispensaries. It was estimated that the sanatorium beds would cost 25*s.* or 30*s.* per week; but take 25*s.* The hospital beds would probably cost 20*s.* per week. The tuberculosis dispensaries would cost anything from £1000 up to £2000 each. Taking the lower figure of £1000, and saying 250 were required, the total worked out at £1,303,000, according to the figures of the Departmental Report. The fund available for sanatorium benefit was £880,000, or a deficit of £423,000, that had to be defrayed by the local authorities, with, he hoped, grants from the Treasury.

There was one very serious omission in the scheme which the report did not seem to take cognisance of, and which would upset all calculations. That was the chronic consumptive, the case which had already been to a sanatorium and had treatment and advice and had gone back to work and broken down again. This was to be the crux of the whole question. These cases lasted for years—two or three or more. What were they to do with them? They were no longer available for medical benefit, and local insurance committees would have to provide for them—morally they were bound to provide for them—for the whole course of their natural lives.

This was to introduce an element of uncertainty which would make the expense of sanatorium benefit very much greater than anybody had reckoned. He sincerely hoped that this problem of tuberculosis could be faced boldly, but he wished them to realise that the insured persons alone would cost very much more money than would be available from the fund.

What would be the number of consumptive insured persons they would have to deal with? He was afraid that estimates based upon past experience were not altogether reliable. They found this out at Leicester as soon as notification became compulsory. The number of notified cases was very elastic, and as soon as they put a premium upon the notification of cases by the medical practitioner, the cases notified came in in shoals. They would come to the dispensaries in shoals. Already their dispensary in Leicester, which had only been in existence a year, was overcrowded, and they had to appoint a second medical officer. They would find no difficulty in getting sanatorium beds filled. It was a larger problem than anybody realised, and he hoped money would not be wasted through their not realising how much would be required. It would be a pity to spend too much money on treatment in sanatoria. It was not the cost of establishing sanatoria, but their maintenance—25s. per week per bed per patient—which was serious.

Mrs. Richard Shutt (Salford Union): That Conference had met to discuss the prevention of tuberculosis, and the problem must be faced in the earliest infancy of the child. Up to then the only cases dealt with had been those of children of school age. Nothing had been said of the child from its birth to school age—the period when the mischief was done. Some means should be devised whereby the children of the poor should be taken in hand from their birth to school age. They were only half doing the work, in fact they were not touching the question of prevention, if they only faced it at school age when the mischief was done.

Dr. Trimble (Belfast) wished to refer to a few figures with regard to Belfast. There he believed the introduction of the Insurance Act would save money. When one bed to 5000 of the population was spoken of as sufficient he wished to say that without compulsion and without inducement by the Insurance Act they had at present in Belfast one for every thousand inhabitants. They had now 351 sanatorium beds devoted entirely to tuberculosis, and at the present time their municipal and voluntary contributions entirely for these beds was £20,000 per annum. He therefore looked forward with considerable confidence to the probability that under the Insurance Act they would have a relief in the contribution with which to do something more. And he would suggest that they should do with it something in the way of after-care and research.

Dr. F. Rufenacht Walters (Crooksbury Sanatorium) would confine his remarks to one chief point—the extreme importance of after-care. They would, he was sure, understand that, as he had been connected with special tuberculosis work for twenty-six years, and in intimate connection with a sanatorium for a dozen years, he was the last man in the world to run down the work or to under-estimate the importance of the sanatorium. He had seen too much good done by it to doubt the benefit of sanatorium treatment. But it was only one part of the necessary work of preventing and arresting tuberculosis. There were two important reasons for this view. One was that one might always say that time was insufficient thoroughly to arrest the disease in a sanatorium. In the case of a middle-class patient, who was sent to the Alps for treatment, it was a common recommendation to him, even with slight disease, that he should spend two winters and a summer on his treatment. Why should they suppose that a working class patient should have his disease arrested in four months at a sanatorium? It was true that in a great many cases the disease could be closely confined in four months at a sanatorium. There were three chief functions of treatment in a sanatorium: one to reduce fever—so long as fever was present the patient should be at rest; another was physical training; and the third was educational. Now, something like 80 per cent. of the cases which came to the Crooksbury Sanatorium were at all events not slight cases. He would be quite within the mark, he thought, if he said that 75 per cent. had fever of some kind. The middle-class patient who came had only a slight extent of disease, but required prolonged treatment, often at least twelve months. It did not follow that the whole of that twelve months should be spent in a sanatorium, but that the patient should be carefully followed for at least twelve months, and have a preliminary training in a sanatorium.

Patients did not suffer from tuberculosis only because they were infected. Their health had been undermined by some other cause, in most cases hygienic faults, wrong habits. If they wanted to make an impression upon the disease these must be taken into consideration. The patient should spend as much time as was proper in the care of a sanatorium. But he would suggest that where there was difficulty in providing money for such purposes, not more than half the amount should be spent on sanatorium, and the rest left for after-care and other arrangements. These arrangements might be left in the hands of the dispensary in some cases.

It was a great mistake to get a man in thoroughly good condition, as you could in a sanatorium if he started without fever, and then send him to take his chance elsewhere. The difficulty of cost could be overcome in another way. Places within easy distance of the centres of population might be provided where a man who had returned home well enough to work might spend his nights and get his food at reasonable cost. That was done in Germany. Some such arrangement was possible in all parts of the country, and at a lower cost than at a sanatorium. It seemed to him that treatment which stopped short of private after-care was waste of time and money.

Mr. F. W. Blacow (Salford Board of Guardians) was particularly concerned for those people who were not insured. In great towns they had a vast population who had been attracted, as in Salford, by industries and the docks, and who came to catch the casual work at the docks. This was often infected ground, as was shown by many of their cases. In such casual work a man might work only one day a week, the children were badly clothed and fed, and the family lived perhaps in only one room. The children were almost certain to have to come to the Poor Law authorities for treatment for the chest. What was the good of provision for the arrest of the disease if the prevention were not also considered?

Two classes of people provided very many of the infected persons. The casual labourers were the first class he would speak of. These men, through no fault of their own, were immediately in difficulties when there was no work in their own trade. If a man was honest and willing to work, would it not be wise to provide that man with a decent living income to get food for his family and to clothe them, and so stop disease?

The next class that came under his observation was composed of widows and children. There were many such in large towns, the husbands having died under the stress of life, for often a man of the labouring class was old at thirty-five or forty, and early deaths left many women widowed with large families. One great reform required in this country was that the relief given to such by the Poor Law should be adequate. It was no use leaving this to the discretion of Boards of Guardians. Some were generous but Boards of Guardians were liable to be censured by the ratepayers, and by the many societies existing to keep the rates down. The Local Government Board should adopt one generous scale for the whole country and not leave it to the choice of Boards of Guardians. If the country decided there should be a living income, and that the widow with dependent children should be adequately supplied with money, it could then say to these people: "We have placed you in this position and we now expect you to keep your homes clean and your children healthy"; there would then be less disease.

Dr. F. E. Wynne (Medical Officer of Health for Wigan) said they all welcomed the fact that they were met under circumstances under which that movement would become a statutory one. That fact made it incumbent upon them to face some difficulties, the great difficulty being finance.

It seemed to him that the provisions of the Finance Act, 1911, in reference to capital grants were very liberal. The million and a half would go a long way towards providing the necessary beds. But then, what was there for maintenance? 1*s.* 3*d.* for every insured person and a possibility of Treasury grants. It would be difficult and almost impossible to get local authorities to establish schemes until a definite assurance as to the grants was given.

It was not fair to expect members of local authorities to make the effort of imagination required to realise the enormous cost that consumption meant at present. It was their duty to look to the protection of the rates. That effort of imagination should be made by those at headquarters with the wider information at their disposal.

The next great difficulty would be the relative position of the new tuberculosis officers with the existing medical officers. He was glad to hear from Dr. Leslie Mackenzie that the distinction between preventive and curative work was lessening, and that the work of the new tuberculosis officers must be done in collaboration with the existing officers. If that work were not done in collaboration with, and were not done under the direction of, the medical officer, a deal of tuberculosis administration would be hung up in committee and divorced from the important public health work going on, especially in connection with housing.

When sanatoria were established on the national basis they would have no compulsory power of sending patients there, although consumption was well known to be a disease to be dealt with under the Infectious Diseases Act. And when they had compelled them to go they would still have no powers to compel them to submit to the necessary treatment. In these circumstances the money spent on some would be so much waste; he hoped they would have legislation to adjust these matters. He thought that the ideal sanatorium of the future would not be a marble palace in the country, but rows of workmen's cottages put into sanitary condition, where patients might be taught how to live healthily in conditions exactly similar to those of their own homes.

Dr. T. Eustace Hill (County Medical Officer, Durham) had not intended to speak at that Conference, but was glad to have the opportunity of saying how valuable to him had been the papers given and the discussions which had taken place. The Conference had come at a most opportune time, and without doubt would be of the greatest help to many of them having these most difficult problems to solve. There were one or two points on which he wanted information. In the first place he would like to make a remark on the important question of cost. That always loomed largely in the distance when any question of work for the public health came up. He thought the cost had been exaggerated in some minds. He certainly was very astonished to hear that sanatoria could not be built at a cost of less than £300 a bed, for, as a matter of fact, it had been done and could be done for half that sum.

Next he wanted to ask: Supposing a county borough or county council authority, deciding to provide dispensaries and a sanatorium, straight away promulgated a scheme, what certainty had they that use would be made of the accommodation by the local Insurance Committee? He knew that provisional committees were being appointed, and he should be glad of enlightenment on that point. Naturally county councils hesitated to launch out on expensive schemes until they got into touch with those who knew approximately how many would be sent to them for accommodation.

Another point was as to the relation of county boroughs and county councils in the provision of sanatoria. It happened in his county, with a population approaching a million without the county boroughs, that they had, in accordance with the recommendation of the Interim Report, approached those county boroughs on the question of joint action. They wanted to know whether that joint action should be in the form of a joint committee, or whether the larger authority should provide the sanatoria and the county borough councils come to an undertaking to pay certain sums for a certain number of beds. He was afraid in most districts there was a certain amount of mutual antagonism, and that a joint committee might not be a success.

He did not see any difficulty in places where they were unable to supply the unit of 100 beds in making arrangements with the county council for accommodation. There were one or two matters which had not been referred to. One was the importance of co-operation and of joint bargaining. There was no doubt that if they were to make the national scheme a success they must have co-operation. And then he was rather afraid that the medical practitioner himself would have to educate himself in the treatment of consumption.

There was room for the co-ordination of the whole of the nursing institutions in this scheme. Health visitors, school nurses, nurses in connection with the tuberculosis dispensary, should be co-ordinated in one comprehensive scheme. In his own county they were promulgating a scheme for appointing a sufficient number of trained nurses to cover the whole county. That was, he thought, one of the most important matters in dealing with tuberculosis. They had to begin to treat tuberculosis from the age of one, and they should co-ordinate all agencies, whether dealing with children at school or with the notification of phthisis and with all that lay between.

Dr. LESLIE MACKENZIE (replying to the discussion) : I will deal with the question of what guarantee the county councils can have that the Insurance Committees will send cases. As I said, the arrangement to provide treatment is obligatory, and must be approved by the Insurance Commissioners. Arrangements must be made with the institutions available. If they are institutions of the county council the patients will naturally go there. Public authorities will have the rates to call upon, and I should anticipate that public authorities will thus be able to offer advantages not open to charitable organisations. There is, however, no obligatory condition that Insurance Committees shall send their patients to any particular place.

Dr. S. G. Moore (M.O.H., Huddersfield) said the point he wished to bring under their notice seemed to him of some importance. It had been ascertained that many individuals who died in workhouse hospitals from diseases which were not recognised as being in any way connected with tuberculosis showed in startlingly large numbers healed scars in the lungs which clearly demonstrated the fact that at some period of their lives they had suffered from tuberculous disease of the lungs. They had recovered from the disease, and it seemed to him that that fact, which was quite incontrovertible, was one of very great significance and importance in any investigation and any effort which had to be made against tuberculosis. These facts came under his own personal notice so far back as 1890, and if these people recovered without the assistance of sanatoria, or tuberculin, or tuberculosis dispensaries, —without any of our modern insight—and if the facts which had been ascertained in recent years left unexplained the phenomena he had referred to, then it seemed to him they had left out of account a question of importance sufficient to warrant considerably more attention than it had received. These people, who at one period of their lives suffered from extensive disease of the lungs, recovered, and could they discover what it was that enabled them to do so, he thought their labours would have advanced very considerably.

Dr. A. S. M. MacGregor. (Glasgow) based his excuse for saying a few words upon an experience of three years in the working of five permissive tuberculosis dispensaries in Glasgow. He wished to record the conviction that the tuberculosis dispensary should be run as an adjunct of the department of the medical officer of health. In Glasgow they had 62 per cent. of the population living in one- and two-apartment houses; 75 per cent. of the notifications of phthisis were from houses of one and two apartments; 71 per cent. of the deaths occurred in these same one- and two-apartment houses. The problem was undoubtedly a housing question. The facts which he put before them indicated first of all that considerable provision must be made for the consumptive, not because he was an insured person, but because he was a danger to the public health. In the second place they showed that the problem of after-care became intensified. The duty of supervision in the home was the duty of the medical officer of health through his tuberculosis assistants. The simple notification of cases of phthisis was of no use to the medical officer of health, unless he knew whether the patient was or was not infectious, or how the patient was housed. In these particulars his information had to be supplemented from the dispensary physican, and unless the dispensary physician was in close contact with the medical officer of health that information was not properly obtained. The dispensary doctor must visit the homes of the patients living under the conditions which he had described, and in that way he was the officer of the medical officer of health. And his duty in the way of home visitation must include house inspection. He must be able to report to the medical officer of health any conditions which rendered a dwelling-house not reasonably fit for human habitation. In all these ways, the speaker said, it had been strongly brought home to him that the medical officer at the dispensary should not be a person with fads in any particular direction. He should have broad responsibilities. He should be the intelligence officer of the medical officer of health, and he should to a certain extent be the administrative officer of the medical officer of health.

At this point the COUNTESS OF ABERDEEN proposed the following resolution :

"That this meeting desires to draw the attention of public authorities to the discussions and conclusions of this Conference, and calls upon them to exercise their powers of dealing with tuberculosis under the Act."

HER EXCELLENCY said : I only wish to intervene for a moment to support the valuable suggestion of Councillor Neal that the discussions and conclusions come to by the Conference after hearing advice and the results of experience from so many quarters should be sent to the various local authorities throughout the United Kingdom. I am sure if their attention is drawn to the valuable discussions and conclusions of the Conference it would be most helpful in unifying the work of the anti-tuberculosis campaign throughout the country.

Dr. DOUGLAS STANLEY (Birmingham), in seconding, said : It is only this morning that I have been able to attend the meetings, but I have been very much struck by the valuable information which has come from all the speakers, and I think it would be the greatest pity if these valuable suggestions and arguments did not appear in some public form to be made available for the whole of the United Kingdom.

Councillor Neal (Sheffield), in supporting the resolution at the request of the Chairman and Secretary replied to a few points raised in the discussion.

A good deal had been said about treatment in the home and treatment in institutions. One medical officer suggested that sanatoria should not at present be opened, while another medical officer suggested that the proportion of one bed in 5000 was by no means excessive. He ventured to hope that he took the happy mean in the references he made to that subject. He hoped that no medical officer who was charged with the duty of submitting a scheme to the Local Government Board would submit anything but a comprehensive scheme. And he hoped that all authorities—county and other sanitary authorities—would take care that there was provision of sanatoria. At the same time, might they not walk slowly for several reasons—first, because they did not know how much was required; and secondly, because, as practical administrators, they knew the difficulty of getting through a big scheme, and the facility with which a smaller scheme could be passed? When the small scheme was established an addition to it was simple and easy.

Might he say also as to home treatment that they must not lose sight of the fact that tuberculin was applicable to the early case, which might be dealt with by home treatment? He differed from Mrs. Shutt in the view that they were not in touch with infant life. It was a badly organised health authority if it was not in touch with infant life very soon after birth. They not only had touch with infant life through notification of births and health visitation in the home, but medical inspection, followed by visits to the home from doctor and nurses, revealed the weakling. The precise cause of the want of bodily strength in the young child in school life must be determined. But it could be determined at the tuberculosis dispensary the minute the school nurses called the doctor's attention to the fact that they had discovered a child in the home that required some care and attention.

As to the value of tuberculosis dispensaries, he omitted to mention that one branch of their work in Sheffield was the selection of cases that were likely to benefit from more prolonged sanatorium treatment. This treatment might be wasted in unsuitable cases, but he denied that it was wasted from the public health point of view, because the source of infection was removed. As to the recurrent case, it need not be a source of infection. If the patient had been educated to the advantage of open-air treatment, to the fact that the source of infection lay in the sputum, to the destruction of the sputum, to the avoidance of kissing, and anything else likely to communicate the disease—to the removal of the moustache, which might harbour the germs of the disease—if they educated the case in this way, it need no longer even if it became chronic, be a cause of danger to the community.

He was requested to answer a question from a Salford Union delegate : "Is it part of the power and duty of sanitary authorities to provide for and treat cases of tuberculosis in sanatoria or otherwise of unemployed or destitute persons or their dependents who are not insurable, or will they have to go to the Poor-law hospital for treatment ?" This was an old problem. The question whether the sanitary authority should render assistance when the case became a case of destitution for Poor-law assistance would remain until the Poor-law was revised, until they got some better adaptation of the various remedial agencies they had in this country. His own view was that, independent of the Insurance Act altogether, there was a public duty upon all public health authorities to take care of the health of their infant life. He wanted to add that the general medical practitioner had his part to play in the scheme. It was indicated in the Departmental Report. He might have to deal with recurrent and chronic cases. He might even form part of a panel of general practitioners assisting in the work of the tuberculosis dispensary, but if any method was to be successful for the annihilation of this curse it must have the hearty good-will and general co-operation of the general medical practitioner. That duty was a duty apart from the Act. Let them look upon the Act as a grant in aid—as an assistance to them to perform that duty, and, what was more than a money grant, a means of enabling them to attack the earlier cases, and bring about a healthier condition in their midst. He hoped they would not have any deviation of opinion upon this matter, but that they should strongly recommend every authority they represented to produce schemes that would cover the whole of the recommendations of the Departmental Committee.

The resolution was put and carried unanimously.

Dr. Edwin Nash (M.O.H.,Wimbledon), continuing the discussion: With regard to the position of the nurses, the recommendation of the Departmental Committee was that they should belong to a kind of separate authority. He deprecated most strongly the separation of these officials from the Public Health Department. Already they had several kinds of officials—sanitary inspectors, etc.—and visitors for various charitable institutions, calling at people's houses until there was often enough a state of irritation caused by the multiplication of agencies. And if they further multiplied agencies to persecute the poor with philanthropy they would defeat the ends they had in view. The best results would be obtained if these new officials were part and parcel of the Public Health Department. They could keep the medical officer in touch with all the other items about the home—with the delicate children, and everything else in the house—and he hoped they would put forward a very strong protest against their separation from the Public Health Department.

In regard to housing, he appreciated to the utmost the part it played in the propagation of tuberculosis. But it was not entirely the house. It was very often the people who were in the house. He could give a good example from his own district, in the case of four rows of good houses, well-built, the streets wide, with good gardens—as cottages excellent in every way. In two adjoining streets of these houses there was a general mortality of 5 and an infantile mortality of 56, while in two others there was a general mortality of 55 and an infantile mortality of 333. That was not the houses, but the people in them.

They had reached the limit of inspection by male inspectors of property. What was wanted was to establish a service of first-class health visitors, who would teach the people in the houses, and educate them in proper ways of living and how to bring up their children to look after themselves. He had advised his own authority against any further increase of the male staff, and that any additions should be women who would be the friends of the people in their homes.

As to the notification of cases of phthisis he found the same difficulty that another speaker had referred to. He found that a large number of doctors thought that they need not notify, that it was not compulsory, or, if it was, that it was only under the Infectious Diseases Act, by which the maximum penalty was 40*s*. But notification was under a Local Government Board Order, the penalty being one not exceeding £100 for the offence and £50 a day for each day for which the offence continued. He thought that should be known among medical men generally.

SECTION III.

THE POSITION AND WORK OF VOLUNTARY SOCIETIES IN CONNECTION WITH TUBERCULOSIS UNDER THE NATIONAL INSURANCE ACT.

AFTERNOON SESSION, JUNE 7th.

Her Excellency the COUNTESS OF ABERDEEN presided, and gave an opening address on the subject of discussion—"The Position and Work of Voluntary Societies in connection with Tuberculosis under the National Insurance Act."

HER EXCELLENCY said: May I be allowed in the first place to say how greatly gratified I have felt in being asked to take the Chair this afternoon at this important section of a Conference which I think will be considered as historical in our anti-tuberculosis campaign. It is, indeed, delightful to come here and to feel how kind and earnest is the interest which has been evoked, and how great an influence must consequently flow from this Conference.

We are to consider this afternoon the relation of voluntary societies to the anti-consumption campaign. I suppose we have all heard from various quarters the fear expressed—and something more than a fear—that under the operations of the National Insurance Act the voluntary work in the anti-tuberculosis campaign will diminish and that the contributions for such voluntary work will fall off. Of course, it is very natural that these fears should be entertained, but at the same time I think the more we look into the provisions of the Act we see that it has been largely framed with a view to inducing voluntary help to supplement what the official work cannot of itself compass. In many countries the anti-tuberculosis campaign has originated with voluntary societies.

Doubtless our medical friends have preached to us and warned us, and sometimes threatened us, but they have themselves told us how these warnings and preachings have often been found of no avail in rousing people from the strange apathy which seemed to prevail regarding this work for so many years. It seemed a long time before people could really believe the good news that this disease which had so long been a scourge to the human race was really a disease which could be prevented and in many cases cured—or arrested—and ultimately exterminated. We are here to-day gathered together one in the faith that we are to see the end of this struggle. We are, as it were, bound together not only in that faith, but in the determination that this shall be so. Not very long ago there was a great conference in New York, of which the watchword was that in 1915 there was to be no uncared-for case of tuberculosis, and that in 1930 a case of tuberculosis would have to be searched for. I don't know whether any of us would be rash enough to set a date, but I think we can hope to see the time when there will be no uncared-for case of tuberculosis in the country. We may also hope that the operation of the National Insurance Act will so bring together all the different agencies at work in this crusade, that there will be that unity of aim and work which up to now has doubtless been largely lacking.

We hope to hear this afternoon from a great many of the societies which have been doing voluntary work in the anti-tuberculosis campaign. And here in Manchester we know that they have been exceedingly active, and that indeed in this respect, as in many others, the rest of the country looks with envy upon Manchester and all the organisations which it possesses. We offer our congratulations to Manchester and its municipality and medical and health department.

I have been asked this afternoon specially to tell you a little about voluntary work in Ireland. I feel a little diffident on the subject, as it seems rather like pressing a local aspect of the work. But I am under the orders of the Association, and you must put the blame of it on the Association and not on me.

I suppose everybody here has read the Interim Report of the Committee on Tuberculosis from beginning to end! I assume that it is so. In it you will see a couple of pages devoted to Ireland that rather convey a sense of puzzledom as to how to deal with Ireland. There is a paragraph which practically says: "What are we to say to a country where there are no county medical officers of health, where the county councils have no regular health powers, and where there is so little provision made for cases of tuberculosis?" And so they recommend us to try to carry out the general recommendations of the report as far as possible, but indicate that we must have liberty, inasmuch as Ireland occupies a peculiar place in regard to the conditions in which she finds herself.

I may just briefly put before you the position in regard to tuberculosis. In the year in which the regular registering of births and deaths was started—in 1864—Ireland occupied a much more favourable position than England or Scotland as regards the death-rate from tuberculosis—at any rate, so far as could be judged from the registering of deaths. But during the intervening years since then there has been so much efficient health work undertaken in England and Scotland that we see the lines on the diagrams indicating the death-rate from pulmonary tuberculosis, and from all other kinds of tuberculosis, going down and down in England and Scotland, while in Ireland they remained about the same, but with a tendency to increase. This is not very much to be wondered at when one remembers the great drain upon the population of Ireland which has been caused by constant emigration of the young and strong. There is also the poor food that a great number of the population have to nourish them, and the lack of health legislation—provisions regarding the public health—more or less all over the country, except in a few places. Year by year the Registrar-General in his reports warned people of the very serious position which Ireland occupied when, out of an average death-rate of some 70,000 annually, there was a proportion of between 11,000 and 12,000 deaths from tuberculosis, with a tendency to increase further.

So it was, after repeated warnings by the Registrar-General, the Local Government Board, and the medical profession as a whole, that it was suggested that some new agency must be formed in order to wake up the public at large as to the serious position of the country threatened by this one disease. In 1907 the Women's National Health Association of Ireland was formed, with the idea that this disease was so largely a disease of the home that what was needed was a direct appeal to the mothers of the country. They were the guardians of the homes of the country. But although it was called the Women's National Health Association of Ireland, we did not wish to exclude men from becoming members, because we recognised that women could not effect what they desired unless they were supported by their husbands and brothers and sons.

From the outset the Association endeavoured not only to devote its attention to anti-tuberculosis work, but to all forms of public health work. It was believed that the best way of carrying on anti-tuberculosis work was to promote other forms of public health work, especially amongst the children. In the autumn of 1907 it started the Tuberculosis Exhibition, which we venture to think the Association in England has copied. The Exhibition was formed as an experiment. It was a good deal laughed at. "What in the world," people said, "are you to do with a tuberculosis exhibition? What are you to show? Are you taking about a cabinet of horrors all over the country?" It was decided we would only try it as an experiment in connection with the International Exhibition in Dublin in the autumn of 1907. From the very outset the place was crowded. The story of tuberculosis exhibitions everywhere was found to be repeated there in Dublin. Then, when we asked the representatives of local authorities all over Ireland to come and hold a conference there and see the Exhibition and consider whether they would like it to travel about and visit different parts of the country, a unanimous desire was expressed that this should be done. And so many were the invitations for a visit from the Exhibition within six weeks of its being formed that a second one had to be got together. These went over the country accompanied by medical lectures and cookery lectures. In every district a number of popular lectures were given. Means of amusement were also provided inasmuch as, though the coming of an exhibition is a great event in the country places, some music and various amusements—little plays and so on—help very much to make it a success.

It was really through this travelling exhibition that the 150 branches of the Women's Health Association were formed. Through it, and through the caravans, which have also gone to the outlying places, the Central Association has not tried to lay down any hard and fast rules as to what the different branches were to do. It has only tried to meet the need of each district, and the people at large showed themselves most apt in taking up the advice and the ideas promulgated about fresh air and good food. And now, I think, we really may say that Ireland is a country of open windows. Sometimes when I have said that, people will scarcely believe it. We were told at the beginning that the prejudice against the open window would be so great that it would take many years to overcome it. Last year, at a health conference in Dublin, some of my Scots friends were present when I made this statement, and they went on expeditions to examine the state of things for themselves, and I am glad to say they came back and said they thought I had been perfectly justified in making that statement. No doubt some of the grandparents have suffered a good deal owing to the zeal of the children and the young people. But on the whole we trust that this has had a considerable influence in the happy result which has been brought about during the last four years in the reduction of the death-rate. In 1907 the deaths from all forms of tuberculous disease were 11,679, and in 1911 the total was 9623. (Applause.) This makes a decrease of 2056, meaning a decrease of one sixth of the total number of deaths from tuberculosis, or forty fewer deaths every week. (Applause.)

I have only spoken briefly about the formation of the work of the Association, in order to lead up to the present position, and to the position in which the local authorities in Ireland—especially the county councils—find themselves at the beginning of the operation of the Insurance Act next month. A few weeks ago the county councils of Ireland were considerably startled at receiving a circular from the Local Government Board informing them that they were considered the authorities which ought to deal with this matter. Most of the county councils had scarcely realised this, inasmuch as they have no general public health powers entrusted to them. But under the Prevention of Tuberculosis Act of 1908 there is a section which especially gave the county councils all necessary powers to deal with tuberculosis. Unfortunately Part I of that Act, which dealt with compulsory notification, and which, owing to pressure in the House of Commons, was made permissive instead of compulsory, so largely occupied the public mind that people scarcely thought of the Act and its permissions except with regard to compulsory notification. And owing to the fear of this compulsory notification very few of the county councils or local authorities had adopted it. And now they find that under the second section of that Act they have all the powers necessary to deal with tuberculosis, and the Local Government Board calls upon them at once to put these powers into operation and start a tuberculosis dispensary in each county and county borough, to appoint a tuberculosis officer and nurses, and provide sanatoria, hospitals, and so on—generally to draw up schemes for carrying out the Act. It is not surprising that they should find themselves rather in a difficulty.

I am proud to say that the Women's National Health Association has been entrusted with the duty and power of making temporary provision for such counties as feel themselves unable to form and carry out the necessary schemes so quickly as they are required. And perhaps it would interest you, as this is of course the work of a purely voluntary society, if I told you what we are proposing to do. A portion of the grant which has been allocated to Ireland has been put at our disposal—simply for the purpose of meeting a national emergency, and of making such provision as the various county councils desire should be made.

First, we offer to make provision for cases in the second stage of the disease. The Dublin Corporation has put at our disposal their Isolation Hospital for these cases on the understanding that we shall be prepared to vacate at twenty-four hours' notice. I think our medical attendants have been able to report most excellent results and we hope to extend this provision. Then, as regards the early cases suitable for sanatorium treatment, we are hoping to acquire some country houses with grounds around them available for the purpose, with temporary shelters and annexes to be put up. This will make provision for cases requiring sanatorium treatment as recommended by the County Insurance Committees. We also have a number of shelters ready to loan for home treatment, and we are starting some institutions specially for children—there is no institution at all for children outside hospitals in Ireland for tuberculosis.

For some years we have had a most successful "Preventorium" at a disused coastguard station. We have found what great results can be obtained by taking away children and young people —and adults too—who have been in danger of infection, to a place where a few weeks of fresh air and good food can be obtained. We hope to be able to extend this and also to start one or more farms for the persons who have been cured, or who have had the disease arrested.

Then there is considerable difficulty in finding doctors who have had special experience in tuberculosis work in Ireland for the thirty-two dispensaries and for the sanatoria which are to be started. Our medical adviser and the medical staff at the Collier Memorial Dispensary in Dublin, together with the hospital attached to it, are arranging immediately for a post-graduate course for doctors who may be available for the different county councils and Insurance committees, and in the same way we are arranging special courses for nurses. We have had for a good many years tuberculosis nurses working in Dublin and Belfast and Cork, and also in some of the country places, and in connection with the Collier Dispensary and the Allan A. Ryan Hospital. The special courses are now being instituted. I hope that later in the afternoon Dr. Crane, who is in charge of our Tuberculosis Dispensary, will give you more information about the work that is carried on there.

In regard to the after-care committees, which will always have to be formed through voluntary work, the Women's Health Association hopes that its various local committees will be able to be of use, and in cases where the county councils don't wish to take up the scheme at all at present until they have thought over it, and wish us to undertake to establish the dispensaries, that also can be arranged. Indeed, this has already been arranged in regard to one of the counties.

I am simply putting these details before you as information. I am afraid you will think that the Women's Health Association has a very great deal of courage to undertake such a heavy responsibility, but we have experienced such extraordinarily kind support all over the country from medical men and public health workers and local authorities that we feel that it is our simple duty to try to put at the disposal of the public authorities the results of the experience which our workers have gained during these four years of work and thought and study on this question. We are only, of course, proposing to carry this on in a purely temporary way until the county councils are able to carry out their own schemes. But I am sure we may count upon your kind sympathy and interest in watching this experiment of a voluntary Association which is trying to do its best. (Loud applause.)

Professor Hope: I am charged with the very pleasing duty of proposing a very hearty vote of thanks to the Countess of Aberdeen for the particularly interesting address she has given to us. We have all followed, perhaps far more closely, may I say, than her Excellency imagines, the progress of events in Ireland, and we all admire the splendid way in which the work of dealing with tuberculosis has been carried on there under Her Excellency's guidance. It is, however, news to us that the Women's National Health Association of Ireland has been strong enough to shoulder burdens which the law proposes to impose upon county councils, and if I may venture to say so, I think the county councils will find that the work is so well done that they will hesitate to relieve the ladies of the burden which they have voluntarily undertaken. I hope it may be so. The admirable suggestion, which I hear for the first time, to establish post-graduate courses for doctors and special courses of training for nurses to meet this emergency is another illustration of the thorough and admirable foresight which has been displayed in Ireland in dealing with this question. I am sure you will join with me in giving your most sincere thanks to the Countess of

Aberdeen for her address, and we shall add very sincerely our thanks to those associated with her ladyship in the work in Ireland. (Loud applause.)

Prof. Sims Woodhead : I have very great pleasure in seconding that resolution. I may say in connection with this that perhaps we very often do not realise what is going on at our very doors. When I was in America some years ago I found there that the Americans studied what was going on in Ireland more carefully than we in this country, and they took an early opportunity of offering recognition to Lady Aberdeen for the excellent work done by the Women's Association in Ireland. It is, as we all know, a woman's question. We doctors know that perhaps better than anyone else, and when those who have a responsibility to assume act in this splendid way we cannot doubt that our object will soon be accomplished. I have very great pleasure in seconding the resolution.

The resolution was carried with the greatest enthusiasm, and the Countess of Aberdeen having signified her appreciation of the Conference's vote of thanks, the business of the Conference proceeded.

THE POSITION AND WORK OF VOLUNTARY SOCIETIES IN CONNECTION WITH TUBERCULOSIS UNDER THE NATIONAL INSURANCE ACT.

By Miss M. E. BROADBENT.

In view of the fact that the Insurance Act makes no reference to voluntary agencies for the promotion of health and the treatment of sickness, beyond permission to the Insurance Committees to subscribe to certain institutions, such as hospitals and dispensaries, and that it does not, in any case, apply to anyone under the age of sixteen, it may seem useless and unnecessary to consider the position of societies which deal only with children.

On the other hand, the organisers of this Conference have been so impressed with the importance of tuberculosis in childhood, and its probable influence on the sickness of later life, that no less than three sessions have been devoted to the subject of its prevalence and to the need for its early recognition and treatment.

The Invalid Children's Aid Association, which now covers the whole of London and has thirty-two branches or federated societies in different parts of England and Scotland, is keenly interested in this question, and has for many years arranged for the treatment of children suffering from different forms of tuberculosis in homes or special hospitals in the country, guaranteeing the necessary payment and finding suitable vacancies. An even more important part of its work is the supervision, by means of voluntary visitors, of these children in their own homes, both while they are attending the London Hospitals as out-patients and after their return from the country when the disease is said to be arrested.

The Insurance Act mentions among possible future benefits the treatment of the families of insured persons, and it is quite certain that in many cases in which a parent is suffering from advanced phthisis, some of the children will be found to be infected and will require treatment if they are to be saved from the development of disease.

The institution of tuberculosis dispensaries, which is probable under the Insurance Act, will enormously increase this preventive work, and the figures of the St. Marylebone Dispensary for the Prevention of Consumption for the year 1911 illustrate the direction in which future action is likely to be required.

In connection with 204 cases of pulmonary tuberculosis, 723 contacts belonging to their families were examined, of whom 420 were found to be healthy, 290 were infected with tuberculosis of the lung, and 13 with other forms of the disease. A further division was made into patients, non-infectious at the time of examination, in whose sputum no tubercle bacilli were found, and those in an infectious stage. In the first class there were 101 patients, and out of 390 contacts, mostly children, who were examined, 287 were found to be healthy, while 102 had signs of pulmonary tuberculosis, and one was suffering from some other form.

In the second class there were 103 patients, and 333 contacts were examined, of whom only 133 were entirely healthy, 188 being infected with pulmonary tuberculosis and 12 with other forms of the disease. It may, or may not, be significant that out of a smaller number of contacts, 12 were found to be suffering from forms of tuberculosis other than pulmonary, where the tubercle bacilli were present in the sputum of the parents.

These children were kept under the supervision of the dispensary and were regularly weighed. Most of them were attending the ordinary day school, and they continued to do so, their homes being visited and the conditions made as satisfactory as possible, but a certain proportion of them were found not to gain in weight, and in many cases the temperature was irregular. The experiment was tried of sending them to spend the day in Regent's Park in charge of a teacher, and the park authorities have now granted the use of the band-stand as a shelter. The children take their own dinners, and although no extra food has been provided, the weights in almost every case have gone up, due, as the mothers themselves say, to better appetite. The class has now been in existence for a year, remaining open during the August holidays and all through the winter, the children returning on January 1st by their own wish instead of taking an extra week. There were between thirty and forty on the register during the winter, and the attendance, which is practically voluntary, never sank below nineteen on the worst day, in spite of the fact that no heat could be provided excepting rugs and some foot-warmers, the average attendance being twenty-seven.

In a few cases, where disease was advanced, or where parents were so ill that removal from home was desirable, the children were sent through the guardians to the homes of the Metropolitan Asylums Board, and a certain number remained who needed to be sent to a sanatorium.

The demand for the treatment of these children has increased rapidly of late years, and in 1911 there were in London 1381 children referred to the Invalid Children's Aid Association as suffering from some form of tuberculosis. The accommodation available is extremely limited. Children have been taken at Dr. Jane Walker's and at Dr. Esther Carling's sanatoria, and the Children's Sanatorium at Holt, which is now being enlarged, was one of the earliest attempts to provide for children suffering from pulmonary tuberculosis, but there has been increasing difficulty both in finding suitable homes for the children and in raising the cost of their maintenance in the country.

Children who are of an age to attend school will be more or less provided for by the Education Authority. Open-air schools and improved methods in ordinary schools will no doubt help to solve the problem so far as children between the ages of five and fourteen years are concerned, though even here the friendly supervision in the homes, which is found to be so necessary, will become a costly burden unless voluntary help is enlisted.

The Public Health Authorities, again, are showing much activity in the inspection and care of infants, as well as in the control of phthisis, and in such places as Huddersfield and Westminster are utilising the services of voluntary visitors under official guidance. Children under school age are, however, still left to the care of their parents, and it is in these early years that a large amount of tuberculosis occurs, more especially of those forms other than pulmonary.

In London the homes of the Metropolitan Asylums Board will still be available, and no doubt the guardians in other parts of England will continue to treat, either in their own institutions or by paying for them in others, the children even of insured persons when they are compelled to apply to the Poor Law, but in the singular multiplication of official bodies who are dealing with the health of the people there seems to be little co-ordination of effort, and there is in many cases much overlapping. It has often been left to the voluntary institutions or societies to fill the gaps existing, and it must be acknowledged that in any great national scheme for the prevention of tuberculosis a very large gap is left if the children are not included.

The education authorities, in London and Liverpool at any rate, recognise the value of voluntary work in co-operation with the official, and the Invalid Children's Aid Association is in touch with all the special schools, and is represented on many of the Care Committees. In the Interim Report of the Departmental Committee on Tuberculosis it is recommended that Voluntary Care Committees should be formed in connection with the tuberculosis dispensaries, and that in this way all available agencies should be linked up. This might bring into touch also those who are specially interested in the children, and might lead to more definite division of the work between the various official bodies and the hospitals and voluntary societies, which at present often deal with the same children in turn, thus wasting much energy and doing away with the continuity of treatment which is so desirable. Voluntary agencies have done much in the past for the prevention and treatment of illness, and will, no doubt, continue their work for a time, but they are hampered by the difficulty of getting money, and if this difficulty is increased by the Insurance Act, it might seem well that the insurance committees should consider the wisdom of making a grant to societies or institutions approved as of public utility (according to the French method) proportionate to the work done and to the funds raised from other sources.

THE POSITION AND WORK OF VOLUNTARY SOCIETIES IN CONNECTION WITH TUBERCULOSIS UNDER THE NATIONAL INSURANCE ACT.

By Dr. H. E. DIXEY.

In considering the work and position of voluntary associations in connection with tuberculosis as they may be effected by recent legislation, it may be well to draw attention in the first place to the sections in the National Insurance Act bearing on the question.

These are:

VI. Sanatorium or Other Institutions.

Benefits.—S. 8 (*b*). Treatment in sanatoria and other institutions is a "benefit" under the Act.

Administration of.—S. 14 (1). "Sanatorium benefit" is in all cases to be administered by insurance committees.

Arrangements.—S. 16 (1). For the purposes of administering "sanatorium benefit" insurance committees *shall make arrangements* to the satisfaction of the Insurance Commissioners:

(*a*) With a view to providing treatment for insured persons suffering with tuberculosis, or other such disease, in sanatoria and other institutions *with persons or local authorities* (other than Poor Law) *having* the *management* of sanatoria or other institutions approved by the Local Government Board, as respects insured persons resident outside as well as within their area.

Tuberculin dispensaries, etc.—(*b*) With a view to providing treatment for such persons otherwise than in sanatoria or other institutions.

Sums available.—S. 16 (2). The sums available for sanatorium benefits in each year are, (*a*) 1*s.* 3*d.* in respect of each insured person resident in the county out of benefits payable under Act, and (*b*) 1*d.* in respect of each person out of moneys provided by Parliament.

Research.—Insurance commissioners may retain any part of sums payable by Parliament for purposes of research.

Selection of patients.—S. 16 (3). Insured persons will not be entitled to sanatorium treatment unless the insurance committee recommend them.

Cost of conveying patients.—S. 16 (4). Insurance committees may defray the whole or part of the expense of conveying insured person to or from a sanatorium.

Dependants of insured persons.—S. 17 (1). Insurance committees may extend sanatorium benefit to dependants of insured persons resident in the county.

County councils and excess expenditure.—S. 17 (2 and 3). If in any year the amount available for "sanatorium benefit" is insufficient to meet the expenditure on insured persons or their dependants, the insurance committee may transmit to the Treasury and county council an account showing the estimated expenditure, and the amount of the sums available for defraying sanatorium benefit; and if they sanction such expenditure each of them is liable for one half of such excess expenditure.

Payments to insurance committees.—S. 61. All sums available for sanatorium benefit are to be paid to insurance committees at the commencement of each year.

Grants by Local Government Board.—S. 64 (1). If under any other Act "of the present session" (1911) any sum is available in aid of sanatoria, or other institutions for tuberculosis (tuberculin dispensaries) or other diseases as the Local Government Board may appoint, such sum shall be distributed by the Local Government Board.

Provided, that such sum shall be apportioned between England, Wales, Scotland and Ireland in proportion to their population.

County Councils may provide.—S. 64 (2). If such a grant is made to a county council the Local Government Board may authorise the county council to provide such an institution, and when so authorised the county council shall have power to erect and maintain such an institution.

Joint boards.—S. 64 (3). For purposes of facilitating co-operation amongst county councils and local authorities (not Poor Law) the Local Government Board may constitute joint boards.

Agreement with sanatorium committees—S. 64 (4). Insurance committees may enter into agreement with any persons or authorities (other than Poor Law) for providing treatment of insured persons in a sanatorium or other institution.

Under the Finance Act, 1911, a sum of £1,500,000 is available for the purposes of the provision of, and making grants in aid to, sanatoria and other institutions in the United Kingdom. This sum is to be apportioned between England, Scotland, Ireland and Wales in proportion to their respective populations according to the census of 1911, and it should be observed that the institutions to which grants may be made are *not* confined to institutions for the use of insured persons, but the money is available for the provision of institutions for the use of the whole population.

In any consideration also of the work and position in the future of voluntary associations, the very important departmental report on tuberculosis lately issued must be considered, for the recommendations contained in this report are of a very far-reaching character, and would, if carried out, very materially affect the position of all voluntary associations in tuberculosis. This report lays down the principle that any scheme which is to form the basis of an attempt to deal with the problem of tuberculosis shall provide :

(1) That it should be available for the whole community.

(2) That those means which experience has proved to be most effective should be adopted for the prevention of disease.

(3) That a definite organisation should exist for the detection of the disease at the earliest possible moment.

(4) That within practicable limits, the best methods of treatment should be available for all those suffering from the disease.

(5) That concurrently with the measures for prevention, detection, and treatment, provision should be made for increasing the existing knowledge of the disease and of the methods for its prevention, detection and cure by way of research.

The report says, Sec. 17—

"BASIS OF THE SCHEME RECOMMENDED FOR THE UNITED KINGDOM.

"17. The scheme which the Committee desire to recommend for the prevention, detection and treatment of the disease is intended to complete existing public health administration in respect of tuberculosis, and is based on the establishment and equipment of two units related to the general public health and medical work carried on by the medical officers of health as described later and working in harmony with the general practitioner. The first unit consists of the tuberculosis dispensary, or an equivalent staff as set out in this report. The second unit consists of the sanatoria, hospitals, etc., in which institutional treatment is given. The precise functions of the tuberculosis dispensary are dealt with in the next succeeding section of the report. The committee are of opinion that the tuberculosis dispensary should be the common centre for the diagnosis and for the organisation of treatment of tuberculosis in each area, at which the various bodies and persons connected with the campaign against tuberculosis will be brought together. The aim should be that no single case of tuberculosis should remain uncared for in the community, and that whatever services the scheme provides should be available for all cases of the disease. Next to the tuberculosis dispensary should stand the second unit, consisting of a system of sanatoria, hospitals, farm-colonies, open-air schools, etc. The tuberculosis dispensary should be linked up to these institutions, for which it will act as a clearing-house."

And in Secs. 29, 30, and 31, it deals very comprehensively with tuberculosis in children.

. I need hardly say that I cordially agree with all the recommendations contained in the report, as I believe that if thoroughly and efficiently carried out they would go far to curtail and lessen the disease, but I would point out that the carrying out of these recommendations will involve the expenditure of a large amount of money, and that neither under the Insurance Act nor under the provisions of the Finance Act, 1911, is there any adequate provisions made for finding the necessary funds.

It is idle to imagine that it can, except to a very small degree, be provided by voluntary agencies, and unless the Government and local authorities will make large provisions in providing the necessary funds the scheme in my opinion can never be carried out.

It is true that county councils and local sanitary authorities have already extensive powers under the Public Health Acts and under the Compulsory Notification of Consumption Order of 1911 for carrying out some of the recommendations of the departmental report, but the present plan of issuing departmental suggestions with "the pious expression of hope" that local authorities will carry them into effect is in my opinion useless, and unless legislation makes these powers compulsory, and not *permissive*, I fear that nothing real will be done. Some authorities would doubtless carry out some or all of the suggestions contained in the report, but others will not, with the result that no general scheme affecting the whole country will be carried out, and unless the scheme is universal the good results we might confidently expect from the adoption and carrying out of the recommendations of the departmental report would be very greatly lessened.

I would suggest that the Government should give a really substantial grant out of Imperial funds and not leave them only to be found by the local ratepayers, who, especially amongst the smaller middle-class part of the community, are already so greatly over-burdened by the ever-increasing growth of local rates, and that in a scheme such as this, affecting as it does the health and welfare of the whole of the community, the cost should be borne principally by the State by means of grants to local authorities and to voluntary associations.

I think that if any voluntary work is still to be carried on it will only be by the Government recognising fully the work of these associations, which have already done good work in connection with tuberculosis or are willing now to do so. Under the Finance Act it is possible for the Local Government Board to give a grant in aid to existing institutions when approved by the department, and this provision I hope will be fully and generously carried out.

In Worcestershire and other counties we have county nursing associations with their nurses working in different places. If a grant were given to these associations these nurses might act as health missioners, as suggested in the departmental report, and their number be increased so as to secure the services of a competent fully licensed nurse in every district in a county, but the administration and carrying on of this work must be left, as now, to the committees elected by the subscribers, subject only to the annual report of their work, in connection with the grant made, to the Local Government Board or Insurance Commissioners.

It is imagined by many people that philanthropic work and State aid might work together and be supplemental to each other, but in my opinion if the work of these voluntary associations is to be *controlled* by a government department all voluntary help and interest in the work will soon cease.

If, however, some such scheme as I have suggested is adopted, voluntary organisations might still go on and help in the greater and more comprehensive scheme which the government should undertake.

THE POSITION AND WORK OF VOLUNTARY SOCIETIES IN CONNECTION WITH TUBERCULOSIS UNDER THE NATIONAL INSURANCE ACT.

By Mr. E. S. KEMP,
Charity Organisation Society, London.

I am anxious to put forward as briefly as possible a few suggestions as to the lines upon which voluntary agencies and charitable societies and persons should work in connection with the provision of treatment for consumption under the National Insurance Act. The London Charity Organisation Society is, I think, well qualified to express an opinion on this subject: the Society is daily providing treatment for the consumptive poor throughout London, and since 1902 has undertaken the special work of sending suitable patients to sanatoriums for treatment. There is no other unsectarian charitable society in London which undertakes this particular piece of work; the experience which the Society has gained is therefore, in a sense, unique, and those who have had to do with it should perhaps be able to offer some suggestions as to how the work of the Insurance Commissioners in this connection can most successfully be carried through.

The Society's experience has shown the value as well as the limitations of sanatorium treatment. We have learnt that this form of treatment is suitable only in certain cases, and that it cannot be universally applied; it is, we think, also clear that those who nowadays decry this form of treatment as useless are equally wide of the mark. Our latest figures show that over 52 per cent. of the whole number of those for whom, since 1902, we have provided sanatorium treatment, were, early this year, well and working, or fit for work. A question as to the permanent value of sanatorium treatment was asked this morning. Well, this 52 per cent. is our figure, and I do not think it is a bad one. This result has only been obtained by proceeding on very definite and ordered lines, and I think I should state as briefly as possible what those lines are. The patient requires no recommendation beyond the fact that his is a suitable case for sanatorium treatment—a matter in which not only the condition of his lungs, but his character and the condition of his home, must obviously be taken into account: he is examined by a specialist in chest diseases, and goes, with the minimum of delay, to a sanatorium, where he is kept as long as the sanatorium doctor wishes him to remain; his family is provided for while he is away, and efforts are made on his return to find him suitable work, or to improve the conditions under which he must work. After-care is carried out as far as possible: the patient is looked up from time to time, and in the event of his breakdown further treatment can be provided. The information obtained by this system of following up enables the Society to state at any time the present condition of all those who have at any time been provided with sanatorium treatment.

In the light of this experience it should be possible, I think, to make certain suggestions as to the line that voluntary agencies should take in connection with the provision of sanatorium treatment under the Act. I think that apart from actual co-operation in the treatment of patients, the first duty of those of us who have had practical experience on voluntary lines is to offer ungrudgingly such advice as many of us are really in a position to give. This suggestion may appear to be in the nature of a platitude; I assure you I believe very strongly that it is something much more than that. I must confess that some of us view with considerable misgiving what may occur in connection with this provision of sanatorium treatment under the Act; the experience of my own society shows that if one is to make a success of it, one must have the freest possible hand. A patient's period of stay at a sanatorium must not be arbitrarily limited to three months or six months. The amount of the provision for his family also should not be limited, nor the period during which it is given curtailed. In the first case a man might very well refuse to go away if his family were insufficiently provided for; in the second case a patient would return before the disease was arrested if the family income failed. Is it possible for a national scheme, which is bound to work on certain fixed rules, to be elastic in matters of his sort? Many of us have noted with great appreciation that the necessary elasticity has been insisted upon in the interim report of the departmental committee. But I am not without grounds to go on in expressing fears about this. During the past few years in London, certain borough councils have undertaken to provide sanatorium treatment for patients selected by their medical officers ; I believe I am right in saying that in every case the period of the patient's stay is limited. In one case, for instance, each patient goes away for two months, which may be extended to three months, but never longer. I do not think that the work on these lines is worth doing, and if it is to be done under the Insurance Act in this way it will prove bitterly disappointing to the public. I should explain, perhaps, that the treatment under borough councils to which I have referred is not intended to be educational merely, but curative. I suggest, therefore, that it is our duty, so far as we can, to see that the insurance committees are hampered as little as may be by red tape. Some of us, no doubt, will be members of these committees, and I hope we shall endeavour to enforce upon them that adequate treatment for a limited number is better than inadequate treatment universally provided. Fortunately it would seem that the commissioners will have very wide powers within the Act: experience only can show how far it will be possible under the terms of the Act to provide treatment efficiently and completely.

As to practical co-operation in individual cases, it seems clear that, however wide the powers of the Commissioners may be, there will be many of the insured who, to begin with at any rate, will be unable to benefit by the provision of sanatorium treatment under the Act. It is obvious, I think, that the majority of consumptives, as the result of ill-health, and consequent inability to work, will be Post Office contributors. They will be provided with sanatorium treatment if need be, but their sick pay will be limited according to the amount of their contributions. It has been calculated that a deposit contributor to secure three months' sick pay, must contribute regularly for over three years; one is inclined to ask how many are likely, in view of their ill-health, to be able to do so? And if they have not been able to do so, how many married men will care to go away and leave their families unprovided for? It seems likely, then, that there will be many applications to such societies as my own for assistance during the absence of the bread-winner at a sanatorium. It might be argued, on the analogy of the evil results of supplementing out-door relief, that if such assistance is provided from voluntary sources, the Government will never offer to complete their own scheme by providing it themselves, and that, as charitable assistance will not be available for all who require it, a cruel and perpetual disability will be created. Others, however, will urge, I think, that such assistance should not be refused, though every effort should be made at the same time to urge the Government to complete their own scheme. As to the societies and hospitals which now provide sanatorium treatment for the poor, I should say: "Go on; your work will still be wanted; for many years, at any rate, there will be those who, for one reason or another, cannot secure treatment under the Act." But if I am to say "Go on," I should, perhaps, add, "If you can." My own society's funds for providing sanatorium treatment are dried up; an appeal on a wide scale is to be made very shortly, and if this fails, our work must fail also. If a national scheme covered the comparatively small plot of ground which my society covers we should have nothing to complain of; but if this is not the case, and public support fails us, I fear that a good many of the consumptive poor of London will fall between two stools.

I have so far confined myself to the question of the provision of sanatorium treatment; this because it has been a special piece of work undertaken by my own society, and also because it forms one of the main points of the scheme of the Insurance Act. But national action in the matter of the prevention and treatment of consumption will not be confined to the provision of sanatorium treatment, nor has my own society similarly limited its work. We have dealt with cases in every stage of the disease, sending them to such institutions as are suitable for them. We have not lost sight, I think, of the wider aspects of the question, and for some years past have pinned our faith to Dr. Philip's dispensary scheme. There are many dispensaries for the prevention of consumption in London now, and members of my society have had much to do with the work of starting them; now that they are established, their co-operation with our district committees is close and constant; they rely upon us to provide their patients with suitable treatment, and one of the points in connection with the possible failure of our sanatorium work which I feel most keenly is that we may not be able in future to provide this treatment for the patients who the dispensaries are so particularly well fitted to select. We are led to expect public provision for the treatment of consumption which will extend far beyond the supply of beds for suitable patients in sanatoriums. In the first place, the Departmental Committee recently appointed by the Goverment to advise as to what provision should be made has, in its interim report, advocated a wide extension of the dispensary system, a report entirely in accord with the views that my own society expressed in the suggestions they made to the committee. But it must not be forgotten also that the circular of the Local Government Board of November last not only decreed the notification of consumption, but also suggested to local authorities that they should take steps to form schemes in their own areas for combating the disease. It was suggested in the medical press, after this circular had been published, that no scheme could be more effective than the Edinburgh dispensary scheme, and various county medical officers have already adopted it in the proposals that they have made to their public authorities. It is probable, therefore, that dispensaries will be advocated, both by the Insurance Commissioners and by the Local Government Board and the public authorities, and that within a few years we shall see large numbers of them established under public auspices. I hope that we need not anticipate that there will be any rivalry between the Local Government Board and the Insurance Commissioners in this matter; the circular of November last seems to show that the Board is not willing that the Commissioners should be solely responsible; any friction between the two bodies or duplication of effort would be a serious disaster.

What, then, is to be the attitude of voluntary agencies to the new dispensaries that will be set up? If I may divide this subject in the same way that I divided that of sanatorium treatment, I should say first that it is our duty to press in every district for the establishment of a scheme as complete and as efficient as possible.

We must not let the authorities forget that the dispensary itself is only the central point and nucleus of a scheme. Hitherto we have had some, at any rate, of the parts of the scheme; now we are to have the central point, which will be of little use to us unless we can link it up with those parts of the scheme which already exist, and unless we can supply those parts which have hitherto often been lacking. To many people a dispensary means a place where medicine is made up and distributed; we must not let our public authorities believe that a dispensary for the prevention of consumption is merely something of this kind. We must remind them that the scheme will never be complete until the sanatorium, the open-air shelter, the home or hospital for advanced cases, the farm colony, the schools for consumptive children and for those threatened with the disease—until all the details have been supplied and suitable treatment arranged through public bodies or voluntary agencies for all who require it. I noticed the other day a report of a speech made by one of the principal physicians of a provincial chest hospital in which he suggested that an out-patient department, with the assistance of a samaritan fund, could do all that a dispensary can do. I do not suppose he had ever heard of the domiciliary visits of the dispensary doctor, the examination of contact cases, the watching of doubtful cases; in a word, of the preventive work which distinguishes the work of a dispensary from that of an ordinary out-patient department. I only mention this to show how far it is still necessary that those who do understand what the work of a dispensary means should lose no opportunity of making their experience known.

With regard to the actual co-operation on cases which might be undertaken by voluntary bodies, I suppose it may be taken for granted that those dispensaries which already exist will be taken into account by the authorities; possibly a system of grants in aid, accompanied by some kind of inspection, will be brought into operation. In any case I feel certain that there will be much work to be done by voluntary agencies and societies if the dispensary scheme is to attain its fullest efficiency. I think this will be admitted by all those who know how much patient personal work is entailed in connection with a dispensary, work which the medical officer cannot do. Supposing you had a municipal dispensary, a municipal sanatorium, a municipal home for advanced cases, and so on, could you also have a municipal official prepared to persuade those who live in basements to leave them for airier quarters, to advise parents as to careers for delicate children, and to see that the advice was carried out; to visit regularly those in an advanced stage who are restless in the institution to which they have been admitted, but whose return would be a danger to their families, in a word to do all the work which depends so much upon the kindly feeling of the visitor and upon the patient's realisation of the fact that the visitor's interest is personal and unofficial? I do not wish to reflect in any sense upon the value of the work of officials, but are there not times when the influence of the visitor is effective only because he or she is not, and is known not to be, an official? I have chosen an extreme instance, a place in which the dispensary with all its surrounding institutions is municipal; even in such a case I believe there will be much room for voluntary work. But in the majority of cases there will be a number of voluntary institutions of which use will be made, and there seems no reason why the number of such institutions should not increase. We have long known in London, and I think the same is true of other parts of the country, that the existing accommodation for cases of advanced consumption is entirely inadequate. Is there not room now for the establishment of more voluntary institutions of this sort where those who are insured can be sent, and where there will still be room for those who are not insured or who have lost the benefits of insurance? Much was said yesterday, and very rightly said, as to the absolute necessity of after-care for those discharged from sanatoria. In this matter, as the departmental committee has suggested, there is much room for the work of voluntary agencies under the direction of the medical officers of the dispensaries. Many of those serving on these associations will know the patients already: they will understand the conditions under which they live and the possibilities of improving them: they would seem to be the very persons best qualified to deal with this matter. Again, in the very important question of employment, is it not possible for private individuals to endeavour to help those unfortunates whose chance of life depends so largely upon their occupation? I should be the last to forget the immense difficulties of such work as this: as Dr. McConnell and Dr. Jane Walker will tell you, they make a point of advising us as to the future of those patients we send them: their directions we endeavour to carry out, though it is to be feared that often we are unsuccessful. My own personal experience is that to turn a town man into a country man is usually extremely difficult, quite apart from the loss of wages entailed. But I believe that private persons are on the whole best able to take up this work: we cannot be successful if we deal with the poor in the lump; we must deal with them separately and individually. It has occurred to me that some use might be made of the system which has been adopted by the Soldiers and Sailors Help Society in London. That society has members all over London who have agreed to act as friends to the discharged soldiers; each man has the name of his particular friend given him when he leaves the Army, and, if he is out of work, he applies to the friend assigned to him for advice as to what he should do. Would not some such scheme as this be of advantage, particularly in those places in which the number of those who are discharged from sanatoria is not sufficient to justify the formation of a committee solely for the purpose of helping patients to suitable employment? We must try to gather round those dispensaries which are to be established a body of charitable people who will be ready to help supply those things which almost any institution, however adequately equipped, must lack. This is the way in which the voluntary dispensaries are succeeding; need the others be left out in the cold?

I remember once speaking to a body of working men in East London on the subject of the treatment of consumption. In the discussion that followed, one of my audience advanced very confidently the proposition that consumption is caused, as he said, among the rich by over-eating, among the poor by under-eating. That is perhaps an extreme instance of looseness of thought, but I think it has its moral. Unlimited meals alone will not provide a cure for lung disease; housing improvement by itself is not a remedy for consumption, for those who live under the most favourable conditions have contracted it; the mere provision of a sanatorium bed for every consumptive member of the population is insufficient. We have recently been told very loudly and persistently that those of us who do not believe that tuberculin treatment alone affords the remedy we want are the most unmitigated of donkeys. Well, I am afraid that many members of the medical profession, on whom lay societies like my own must rely for advice as to their line of action, must accept this deplorable title. What we most of us look for, I think, doctors and laymen alike, is a combination of methods, not a reliance upon one only. Similarly we want with our combination of methods a combination of forces, and we cannot afford to disregard and to leave outside our schemes the great charitable instinct of our countrymen.

I seem to have been led round to the old charity organisation text of co-operation, and if what I have suggested has any value it would appear that, like other texts, this one may be applied in the future as it has been applied in the past. I am inclined to think that most of all it needs to be applied now. I believe that voluntary work is on its trial; that it has improved immeasurably since the old days of the district visitor's tract there can be no doubt; that it has won increasing recognition within recent years is, I think, equally certain. Under this new national scheme for dealing with consumption it will find its place. I think you may rely upon it not to fail.

DISCUSSION.

Dr. Crowe (Medical Superintendent of the P. F. Collier Memorial Dispensary, Dublin): wished to describe in a few words the details of one of the institutions which Her Excellency mentioned in her opening address. The Collier Memorial Dispensary was the only one of its kind in Ireland, and was opened for the reception of patients in September last. There were 580 patients on the books up to date. The routine followed at this dispensary was as follows: The patient on arrival was seen by a nurse, who took all the details of his history. His weight and height were taken, and he was then examined by the medical officer. Then followed a thing which was absolutely unique. Every patient's throat was minutely examined, so that even the earliest cases of tuberculosis of the throat were discovered, and if the patient were found to be suffering from catarrh this, too, was treated in a prophylactic manner.

The patient after examination was given a card containing minute details as to the method of his life. He was also given such medicine as was necessary. There were three nurses, two of whom visited, Dublin being divided into two districts for visitation, a south and a north side. Next morning the nurse in whose district the patient lived visited his home and inquired into all the details of the family and gave them instructions about keeping the windows open, discussed matters with the mother, and found out such details as how many people slept in a room, etc. In a good many of the houses in Dublin they had found as many as eight or nine people sleeping in one room, including a patient in an advanced stage of the disease.

The particulars were all taken down in full, but the nurse was not allowed to write in the patient's house. It was a great point with Dr. Philip that the nurse should not write in the house because it frightened the people, and they were apt to think she was there on sanitary inspection duties. As soon as she got home the nurse filled in the domiciliary paper, giving all the details, which was brought to him as head of the dispensary. He went to visit the case if necessary, and afterwards countersigned the paper, which was taken to the after-care committee.

The patient's sputum was collected on a second visit and the contents minutely examined. While the patient was waiting to be seen by the doctor he was given a glass of milk and a bag of biscuits—the latter especially done up for them in penny bags. The nurse, when visiting, suggested, but without any compulsion, that the members of the family should come up and be examined. They were at first frightened at the outcry against this, but it had since succeeded beyond their expectations. People of their own free will came to be examined in such numbers that he had had to set apart two mornings of the week for examination of families.

As to sending patients away, the Corporation of Dublin had an institution, but the patients going there must live in the city of Dublin. The majority of patients they sent away lived in the city of Dublin, and they went to the city institution for fourteen weeks, the Samaritan Society supplying them fully with an outfit of all necessary clothes to be used while they were there, and looking after their families. Patients were also sent by them to the Royal National Institution at Newcastle, Co. Wicklow.

The Allen A. Ryan Hospital for thirty-six patients was reserved for intermediate cases. Patients for this institution also were supplied with clothes by our Samaritan Society. Advanced patients were sent to the hostels for the dying or the rest for the dying.

The Dublin Samaritan Society had a sub-committee which met once a week, presided over by Her Excellency. Every case recommended by himself was brought before this sub-committee. The patients were supplied with food, clothing, and milk, the last from the pasteurised milk depôt.

The patients' bedsteads cost only 3*s*. 11*d*. They were given, with mattresses and blankets, Lady Aberdeen's sewing committee lining the blankets with paper. In buying clothing and food, and in paying the rent, and also in buying boots for boys, they were assisted by various associations.

While the patients were away in the sanatorium, their families were supported. Let him give them an instance. One family last December was found in darkness and with no fire; the father had tuberculosis, and a girl, who was the only member of the family working, was on the verge of breaking down. The girl, who had no signs of active tuberculosis, was sent to a preventorium, an old coastguard station, where there was a matron and nineteen beds; the father was sent to the Corporation Sanatorium, a new house was found for them and the rent paid. The girl had now come home the picture of health, and had been keeping the rest of the family on her earnings. The father was back again and able to work.

Dr. W. LOMBARD MURPHY (Throat Specialist at the Collier Memorial Dispensary, Dublin) wished to say a few words about the examination and treatment of the throats of patients who came to the dispensary. Every patient's throat was examined as soon as possible. In some 30 per cent. of the cases of pulmonary phthisis the throat was found to be affected with tuberculosis. When once tuberculosis was firmly established in the throat there was not much to be done. In the early cases, however, much could be done, but the most important part of work of this nature in the dispensary was not the cure of patients but the prevention of the disease. In tuberculous patients the whole of the organism was in a state of diminished vitality. In almost every case there was something wrong with the throat—granular pharynx or anæmia. By treating these conditions in a proper way, giving the patient advice as to avoiding tobacco and drink, the great danger of the tubercle bacillus attacking the throat might be prevented.

From his own experience he must disagree with one thing in the chairman's address; it was much too modest. The Women's Health Association was founded only five years ago, and of the wide range of its activities they had been told. The work which had been done and the greater work which was to be done would be a bright memory for women. It had become an organisation stretching its tentacles all over Ireland—if one might speak of such an anomaly as tentacles in connection with this beneficent work. He, therefore thought her Excellency's address was too modest. They who lived in Ireland knew that the whole of this work and the whole of the good done was largely due to the indefatigable energy of their chairman.

HER EXCELLENCY THE COUNTESS OF ABERDEEN: I may explain that the Collier Memorial Dispensary and the Allan Ryan Hospital are due to the munificence of two Irish gentlemen in America. Mr. Robert Collier, desirous of erecting a memorial to his father, entrusted to us a sum of money, and we founded the dispensary; and the Allan Ryan Hospital was founded by a gentleman in America, who was himself unhappily suffering from tuberculosis.

Councillor EDWARD LAWSON (Leeds Association for the Prevention and Cure of Tuberculosis) said he was one of the representatives sent by the Sanatorium Committee of Leeds, and, as chairman, representative of the voluntary institution for the prevention and cure of tuberculosis in Leeds. He also represented a great number of ratepayers. He wanted to say a few words upon the question of work done by the voluntary associations. It appeared to him from what he had heard that a good deal of what these associations had done was in danger of being lost sight of, and he was afraid there was a danger of the work being taken out of their very excellent hands and handed over to a certain number of officials.

He was aware that he was speaking on a delicate subject. With regard to voluntary hospitals he thought it would be agreed that they had drawn the best of medical men to their service. In the same way, if they looked at the voluntary associations dealing with tuberculosis they would find there men who had specialised in the disease and who had spent a very considerable portion of their lives in doing all they could to deal with it. Was there not a danger of the work being handed over to those who had not had that experience? Was there not a danger of the work being taken out of their hands and given to people who would be paid officials, and who would not devote the same time to the work? With regard to the work done at Leeds they had had a voluntary institution engaged there for twelve years. This institution had its dispensary, hospital, sanatorium, open-air school and residential school. He should not like the meeting to close without something being said of the excellent work the voluntary medical men had done in all these years, and it was for that reason that he had spoken in the manner that he had.

Dr. S. G. Moore (Medical Officer of Health for Huddersfield) wished to make a brief reference to what had just been said by his old friend, Mr. Edward Lawson. It seemed to him that in this very big field of work there was ample room alike for voluntary associations and for official work. It further seemed that the proper spirit in which to approach the thing was a desire on the part of both sides to co-operate freely together and do the best that could be done for the sufferers. They need not go further than the most excellent example they had in the Irish Women's Health Association. The fame and reputation of the work that had been done in Ireland for the last four or five years under Her Excellency's patronage was known in every English-speaking country. Miss Broadbent, in her very excellent address, and Mr.

Kemp, in his remarks, both made reference to a particular aspect of the financial considerations which arose under the Insurance Act in connection with tuberculosis. He thought it was Miss Broadbent who pointed out that in France no society was permitted to collect subscriptions without a license, and that voluntary societies which received Government aid received it in proportion to the amount collected voluntarily. They knew that such work as that of this Association and other similar useful work was largely hampered by lack of funds.

Dr. H. de C. Woodcock (Hon. Physician of the Leeds Sanatorium) was not against State service. On the whole he thought State service was inevitable. All his life had been spent as a voluntary worker in connection with public institutions, and up to then the work against this disease had been done by voluntary workers. The personnel of the Commissioners showed that. They had now come to a transitional period, and it would take a considerable time to educate the army of officers who would take over all this work. They would have to be taught by the men who had now the experience and ability to carry out the work.

There were special characteristics of voluntary work and of official work. Dr. Moore said they must have the co-operation of the two agencies. They were complementary to each other. The work that had been done in Ireland and elsewhere proved the value of voluntary work. In Leeds a few people who worked intensely and were enthusiasts started a sanatorium and tried to grapple with a problem which officials were not grappling with. They took three patients at first, but had since experienced a wonderful growth in their work. The three grew until there were 140 patients. With officialism they had accuracy, but certainly not the same intensity of devotion. At the present time the danger would be that the old guidance would be overthrown, and a position would arise much the same as if Prof. Sims Woodhead were dispossessed and there were put into his laboratory, in place of all the work and wisdom he represented, the last student he had turned out.

The great work done by the voluntary societies must be honoured, and, as Mr. Lawson had said, to throw them over would be as if they threw over a volunteer army before they had formed a regular one.

Dr. Esther Carling (Maitland Sanatorium) wished to say one or two words from the point of view of a sanatorium doctor who received both municipal patients and those of voluntary societies. There were six London boroughs who sent patients to her, and the valuable work that could be done in face of the difficult condition in which they came was most extraordinary. They had heard speeches that day from men from keen municipalities, but there were others. There were municipalities which had no organised system of selecting patients, and who sent most unsuitable patients, the money spent on whom was often practically wasted. On the other hand, she got cases from other parts where extreme care was exercised in selection, and in them the good she could do was multiplied a thousandfold. That led her to the Charity Organisation Society. No agency was so thorough as the local Charity Organisation Society. Every case that came to her had been cared for before it came and was cared for after it went away. The money spent on the sanatorium part of the treatment was thus made effective.

She hoped very sincerely that whatever was being done they would see an extension of organisation and of training for the officers who would look up cases before and after sanatorium benefit. In Ireland the need for special training for doctors and nurses was realised. Before money was spent on buildings they ought to spend some care on seeing how these officers were to be trained for their particular work. Training was of the utmost importance. The training of a sanitary inspector did not give the full information necessary to the phthisis visitor. She hoped some special scheme would be devised for those who were to carry the gospel into the homes of the people.

VOTE OF THANKS TO THE CITY OF MANCHESTER AND THE COUNTY BOROUGH OF SALFORD.

Her Excellency the Countess of Aberdeen: It is my great privilege, the business of the Conference being over, to move a vote of thanks to the City of Manchester and the County Borough of Salford. We all wish to offer our very hearty thanks to Manchester and Salford for the kind way in which they have received this Conference. We know of old the hospitality of Manchester and Salford, and I think that it has been a most happy circumstance that our conference should take place this year under the auspices of these two municipalities. (Applause.)

The earnestness with which all such work as this Association's has been carried out in these two places has been reflected in this conference. May I, therefore, propose that the most hearty thanks be given to our hosts. (Applause.)

The motion having been seconded, the conference signified the most hearty approval.

Dr. J. **Niven** (Medical Officer of Health for Manchester): Your Excellency, ladies and gentlemen: On behalf of the Lady Mayoress of Manchester I beg to offer you the thanks of the Lord Mayor and the City Council for the hearty manner in which you have received this expression of thanks from Her Excellency and the members of the Council of the Association. We have been delighted to receive so many distinguished visitors from all parts of the kingdom, and I think it will be admitted that this Conference has been exceedingly successful. The papers have all been of a very high character, and there is scarcely any aspect of the subject but has received the fullest and most free discussion. I think we have all been enlightened as to the exact bearing of the Insurance Act and as to the effect it is going to produce on this particular subject. All the subjects and the papers have been of a high standard indeed, and I have learned a great deal from them. If we had learned nothing else, it would have been a great help to have heard the exposition of the Act in relation to tuberculosis by one who understands it so well as Councillor Neal of Sheffield. It is a very great advantage to hear the views of those gentlemen who have to deal with the Act and will have to carry it into effect. What you have heard from them must be of very great help to you.

I should like here to be allowed to express a very deep sense of gratitude on behalf of the Corporation and also of the Council of this Association for the splendid work which has been done by the ladies of this city (I will name no names) in organising the work of this Conference and of the Exhibition. It is not only in Ireland, you see, Your Excellency, that the ladies come to the front in carrying on this work. You have done splendid work in the Sister Isle, and here in Manchester also the ladies have been able to do a great work. (Applause.)

A vote of thanks to the Honorary Secretary, Dr. J. J. Perkins, for his services in connection with the Conference was then carried.

A further vote of thanks, which the Conference warmly approved, was accorded to Professor Delépine and the Council of the Manchester University.

The Conference then concluded its sittings.

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